Companion to the Official Catalogue.

SYNOPSIS

OF

THE CONTENTS

OF THE

GREAT EXHIBITION

OF

1851.

By ROBERT HUNT,
KEEPER OF MINING RECORDS.

LONDON:
SPICER BROTHERS, AND W. CLOWES & SONS,
OFFICIAL CATALOGUE OFFICE,
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The preparation of this Synopsis has been attended with many difficulties, arising out of the incompleteness of the arrangements of the objects in the Building. Every care has been taken to insure accuracy in stating the positions of groups and special objects of interest; and should any inaccuracies be detected it is hoped they will be unimportant, and that the omissions will be but few. In condensing a view of so large a collection within so limited a space, it was only possible to embrace the main features, the details being the object of the Official Catalogue.

A SYNOPSIS OF THE CONTENTS

OF THE

GREAT EXHIBITION OF 1851.

The attempt to arrange a system by which with the smallest amount of fatigue the largest sum of information may be obtained in a visit to the Exhibition of the Industry of all Nations, is, from the very miscellaneous character of the accumulation, surrounded with many difficulties.

It is scarcely possible that any two individuals should desire to see the Exhibition in the same way, or probable that they would pursue the same path in their examination of the articles exhibited. At the same time, believing that a guide through the intricacies of this vast space will be a relief from that uncertainty which must necessarily beset a visitor standing in the centre of the transept for the first time, a system for examining it has been essayed. The object of this work is to suggest a methodical and profitable plan of examining the contents of the Building, and to offer a slight outline of the most striking features of objects in the various classes into which its contents are arranged.

We are, in this Industrial Palace, surrounded by the results of the efforts of thought in almost every direction, in which the human mind has tried its powers.

The mineral, the vegetable, and the animal kingdoms, have contributed the material upon which man has worked; and the various arts by which these have been made to assume every variety of form, for use or ornament, have here the most ample illustration.

This opportunity, the grandest which has been offered in the world's history, must not be lost. It is for us to learn what, through time past, man has aimed at, what he has reached within the present, and what may be the powers of advancement which still remain for him,

Course to be pursued through the Exhibition.

It is necessary to adapt this Synopsis to the conditions which have been found expedient in laying out the space enclosed, so as to suit the character of the various articles exhibited, and the order of classification which has been as far as possible maintained in the arrangements. The materials operated on, and the results of human industry, were found, upon careful consideration, to be very fairly comprehended within 30 Classes, and although it has been exceedingly difficult, and in some cases impossible, to draw the line between the beginning of one and the ending of another, this adjustment has been on the whole fairly maintained in the British department. The Exhibitors of the United Kingdom will therefore be found to be grouped rather by the character of their productions than by the district in which they were produced, although some deviations will be detected. In the Colonial and Foreign departments the grouping has been by districts; but within these the same system of classification, which is as nearly a natural one as could be devised, has been, to a great extent, studied. There will not therefore be much difficulty in tracking out any series of illustrations of a similar character from the Home into the Colonial and Foreign departments.

It is important that the line adopted as the most satisfactory one along which to direct a visitor should be briefly stated. The Transept and the groups of articles belonging to the United Kingdom and the Colonies in the Western Main Avenue will first claim attention. Passing round by the western end we proceed down by the south wall and examine the mineral productions and mining, Class 1, and then leaving the agricultural class for a special section, proceed in continuation of the same subject through Class 22, Iron and general hardware. From this we progress readily into the woven materials, and crossing to the northern wall at once examine the machinery in motion by which these are produced, returning towards the Main Avenue to inspect engines and other mechanical inventions. In the bays abutting on the Nave, passing East, we shall find carriage manufacture, furs and leathers, ornamental stone manufacture, furniture, paper, and fine arts. We then purpose passing into the North and Central North Galleries, and examine the works of our potters and our glass manufacturers, naval architecture, engineering, musical instruments, and philosophical apparatus, and pass to the Southern Galleries, where the precious metals, tapestry, silk, shawls, &c., and the vegetable produce and chemical manufactures are arranged, then descending by the southern stairs we proceed through the Sculpture Room and enter into our Colonial departments. These being investigated, the Foreign department will claim attention, and here we shall take each nation in the order in which they are represented, proceeding from the Transept eastward.

Course for examination of contents.

At either end of the Transept the highly ornamented gates show the attention which is now being paid to metal manufacture: entering those from the south an

Statue of Her Majesty. equestrian statue of Her most Gracious Majesty first meets the eye, and the association of the beautiful, exhibited in the specimens of British sculpture spread around, as the culminating point towards which the Statuary. useful tends is happily conceived. In the groups of Amazons and Argonauts, Zephyr and Aurora, Alfred and his mother, and in the poetic figures of Titania, Puck and Ariel, not to mention the other no less favourable examples of British art; we have a very satisfactory proof that practical England cultivates still the study of the beautiful, and that the works of the hard-handed mechanic may be appropriately associated with the efforts of educated fancy to the advancement of the amenities of life.

The Glass Fountain. The Glass Fountain occupying the central place in the building is in every respect a remarkable object. It shows the extent to which glass can be employed for decorative purposes, and the beauty of the material in large works. Nearly four tons of crystal or flint glass are employed in the construction of this fountain, which may be, without much difficulty, converted into a superb candelabrum. At the north end of the Transept equestrian statues of the Queen and His Royal Highness Prince Albert and other works of art meet the view. Looking westward from the glass fountain Bronze Statue a bronze statue of the Duke of Rutland is seen, and Silk Trophy. beyond the Spitalfields trophy, which finely displays the powers of the metropolitan silk-loom; the Horse Bronze Statue and Dragon is another exemplification of mixed metal casting. The colours and characters of the bronzes vary with the proportions in which the tin and copper are combined; and in some cases they are also influenced by the admixture of small quantities of zinc and lead. The next group of objects, in no way remarkable for beauty or picturesque effect, is strikingly

illustrative of the advantages of the Exhibition as displaying the products of other lands. Our interesting colony, Canada, here shows us some extraordinary specimens of her vegetable productions in a pile, displaying a great variety of useful and ornamental woods. Canada Timber.

It is curious to pass from the works of nature to the elaboration of art shown in the marble dog, in which we have a very remarkable illustration of inlaying and mosaic, and from this to the examination of the monument, carved in the stone imported from Caen in Normandy, and onward to the console table and glass, which is said to be the largest piece of ornamental furniture ever made; and the story of the Good Samaritan, as designed for monumental brasses for an altar tomb. As illustrations of the arrangements of particles of matter in the process of crystallization, the extraordinary masses of alum, spermaceti, and the beautiful group of Rochelle salts, the tartrate of potash and soda—must not be passed by: Nature's wonderful geometry is here finely exemplified. Beyond these we have a specimen of the Devonshire marble and its capabilities; a cross in Caen stone, and an altar-screen of oak, with an exquisitely carved trophy of birds, fruits, and foliage, the remarkable feature of it and the attendant illustrations being the application of steam machinery, to produce such involved tracery and deep undercutting as is here displayed. Lord Eldon and his brother Lord Stowell in Carrara marble revive the memories of two extraordinary men whose names are linked to the history of their age. Beyond these we learn the extraordinary size to which the mahogany trees grow, in a sectional specimen from the Honduras. In the clock, at which we next arrive, a good illustration, on a large scale, of the simplification of that machinery by which we mark the tread of time will be found.

Marble Dog.

Caen Stone Monument.

Console Table

Chemical Products.

Devonshire Marble.

Machine Carving.

Statues.

Mahogany.

Church Clock

Elizabethan Fountains.

The Elizabethan fountains, and several models around, conduct to one of those beautiful illustrations of humanity—the lighthouse—by which the dangers of the coasts are indicated. In this is fully proved the advantages of the study of abstract science, the arrangement of the glass prisms being determined by the nicest inductive examination and mathematical calculation of the laws regulating the reflexion and refraction of light. Another, of British manufacture, occurs a little further on. This is of much importance, as hitherto we have been entirely dependent on the Continent for lenticular arrangements of this class.

The Light-house.

The purification of water being at the present moment an attractive subject, the high-pressure filter is interesting. It consists of a hollow sphere of compact sandstone, enclosed within one of iron. The water, by the pressure of a high column, is forced into the sphere, and deprived of all its impurities in passing through the stone. The statue of Shakspere and some fine works in marble, lead us to the Coalbrook Dale glass-house and bronze statues, the whole of which must be regarded as an exemplification of our ornamental metallurgy. The great equatorial instrument is an object of interest. The tube of the telescope is 20 feet long, and the object glass a lens of 1 foot diameter. A large fountain, in artificial stone, occupies a considerable space in the avenue, and displays a variety of jets-d'eaux.

High-pressure Filter.

Coalbrook Dale Glass House and Statues.

Liverpool Docks.

The model of the Liverpool Docks, and a considerable section of the town, on the scale of 8 feet to the mile, will enable all to form a very correct idea of these magnificent works, which, crowded with shipping, convey to the foreigner a grander idea of the commercial marine of this country than any other scene within the island.

We have now reached the west end of the building, against the walls of which will be found many examples of decorative art well deserving attention. As these differ from each other mostly in the style of their ornamentation, the appreciation of them respectively must depend upon individual taste. It may not, however, be amiss to indicate the peculiarities of the Italian and the Pompeian styles, which one set of illustrations offer, or to direct observation to a comparatively new process of imitating woods and marbles upon glass for panels, and introducing thus any variety of artistic design, which, when fixed, becomes permanent, and unaffected by atmospheric influences.

House Decorations.

Painting on Glass Panels.

If it is desired, the objects placed outside the building may now be conveniently examined. These consist of a beautiful granite column nearly 30 feet high, constructed from the Cheesewring Granite Quarries, near Liskeard, Cornwall. The shaft is one solid piece of stone of the length of 20 feet. Two obelisks of granite are also exhibited; an enormous column of coal from Bangor, with several gigantic specimens of fossil fuel. Here also occur specimens of Portland cement; samples of extraordinary slates, and the largest Admiralty anchors.

Granite Column.

Returning, it will be most appropriate to progress by the southern wall, against which many very remarkable specimens of wall decoration, not immediately connected with the class to which this part is devoted, will be found. A series of ornamental woods in very great variety are also placed, and a remarkable display of elephants' tusks and other examples of ivory.

Mining and Metallurgy.

The first thing requiring attention on entering this department, which is intended to furnish illustrations

of the metalliferous and earthy minerals of the United Kingdom, and the metallurgical processes leading to manufactures in metal, are some very instructive educational sets of minerals, and a series of models illustrative of a modified system of crystallography. Whether the ingenious system advocated may eventually meet with the approbation of men of science, or not, the models here exhibited very pleasingly illustrate nature's geometry, as shown in the harmonious laws which regulate the building up of crystals. This is further illustrated by the specimens of gems, some in their natural condition and others cut. On the counters will be found some fine illustrations of plumbago, and the manufacture of black-lead pencils. The largest quantity of this material being raised at the Borrowdale Mine, in Cumberland, and the quality of this being indeed superior to almost any obtained in the world, it may not be uninteresting to state that it is composed of nearly 90 per cent. of pure carbon, the remainder being principally silica and oxide of iron. This mineral is produced in bunches of very uncertain occurrence, but generally of considerable value, the annual consumption being valued at near 4000*l*. A case of polished agates, in which will be seen most of the examples of these fossils, is fixed against the wall, and immediately adjoining it several bottles containing the medicinal waters of Harrowgate, with their composition, as shown by analyses, attached, showing how, in the form of hydro-sulphuric acid, the sulphur is held in solution.

Educational Sets of Minerals.

Crystallography.

Gems.

Plumbago. Black Lead Pencils.

Agates.

Harrowgate waters.

Artificial Stones.

A very interesting series of artificial stones now claim some attention. These illustrate the useful and ornamental application of several kinds of cement. The chemical constitution of these cements is somewhat variable, but they may be in general terms

Cements.

stated to be silica (flint), alumina (alum), lime, magnesia, oxide of iron, and potash, or soda. Roman cement is formed from curious nodules called *septaria*, found in the London clay, in the Isle of Wight, and on the coasts of Kent and Somersetshire, which, with other cement stones, are exhibited in this department. This, or plaster of Paris, in most examples, may be regarded as the base. Gypsum (native sulphate of lime), is exhibited here. White and Son's external and internal stucco, Keene's cement and scagliola, examples of which, executed with much taste, are displayed on the south wall, are compounds of these, with alum, borax, &c. On the same wall, but somewhat more towards the east, will be found a very highly finished example of another patent, in which it appears borax is employed in combination with an acid, the object of this being to correct an alkalinity which has been found, in some cases, to injure the delicate colours employed. The statues and ornamental works around in Greave's and other cements, are of a similar general character.

Gypsum.

Stucco.
Scagliola.

Procuring and preparing the clays employed in the manufacture of earthenware and porcelain form a very extensive source for the exercise of labour. The Cornish china clays, now so extensively used in the Potteries, are here largely exhibited, together with the so-called china-stone. This kaolin, or china clay, was introduced by Mr. Cookworthy, of Plymouth, who first established a *china* manufactory in this country. This substance is the result of the decomposition of the felspar of the granite; it is found largely deposited near the granitic formations, and prepared by washing and slow deposit. Several varieties from the extensive clay-works of St. Austell, and also from the Morley works, on Dartmoor, should

China Clays.

China Stone.

be examined, as a preparation for an inspection of the beautiful examples of the Ceramic art, which our potters are now exhibiting. The china-clay is employed for forming the body of the ware, and the china-stone for giving the fine white glaze, which is the perfection of porcelain manufacture. In connexion with the Dartmoor class, a model of a furnace for "firing" earthenware or porcelain conveys much information.

Kiln for Pottery.

Fuller's Earth.

Examples of our fuller's earth deposits, of our clays fitted for coarser earthen and stone ware, and of sands fitted for the use of the glass manufacturer and the potter, will be found worthy of attention.

Building Stones.

The numerous building-stones exhibited furnish much important information which materially connects itself with architectural economy. We have here

Granite.

granites from near the Land's End in Cornwall, and from Peterhead and Aberdeen, and Ireland and Guernsey also contribute specimens of this valuable stone.

Limestone.

Limestones in nearly every variety occur, Portland stone, Purbeck marble, Bath stone, the Plymouth limestones, and the magnesia limestones of the northern

Sandstones.

counties will be found. Sandstones in great variety are exhibited, the principal districts furnishing them being Yorkshire and Derbyshire. The Kentish rag and the

Marbles.

Surrey fire-stone are also shown. Marbles from Ireland in several varieties may be here examined with speci-

Elvans. Porphyries. Serpentines.

mens of the elvans, porphyries, greenstones, and serpentines of Cornwall, to which particular attention must be directed when we reach the section containing manufactures in stone.

Slates.

Magnificent specimens of slate from North Wales, Dellabole in Cornwall, and many other districts, may be inspected in the arrangements of this section. At the same time, as all the uses to which this valuable stone is applied are illustrated in this spot, it may not

be improper to direct attention to the magnificent slabs from Llangollen with which the principal entrance to the Industrial Palace is paved. The opportunity thus afforded of testing the durability of the varieties employed will not be lost. The feet of thousands treading over them daily for many months will convincingly show their respective degrees of durability.

Bituminous Shale.

Considerable interest was not long since excited by the announcement of the production of an oil from some shaly rocks in the neighbourhood of Purbeck. The same results have been obtained from similar rocks in other localities; and, on the Rhine, naphtha is rather extensively procured from this source. In the cases against the wall will here be found a very complete illustration of this bituminous shale and its products. Immediately adjoining this, a small case tells the very instructive story of the variety of products of coal as obtained by its destructive distillation.

Volatile products from Shale.

Products from Coal.

Following these, several examples of peat present themselves; and, what will now be regarded with much interest, in relation to the projects for employing the peat bogs of Ireland—a series of the substances produced from this curious raw material. If the economical question, which very naturally arises, can be satisfactorily answered, in relation to the hydro-carbon compounds obtainable from peat, the bogs of Ireland, Dartmoor, and other parts of the United Kingdom, now valueless, will become sources of great wealth when developed by the aid of science supporting the efforts of industry.

Peat, and its products.

Coal.

The interest which attaches itself to coal in this country, as one of the great sources of British wealth, will render the information afforded by the specimens here collected together of considerable value. Several of the coalfields of the country are very fairly repre-

sented. We shall find examples of numerous kinds of the bituminous coals, and also of anthracitic or stone coal, as it is sometimes called, much of which is now employed in the iron manufactories. The gradual loss of the volatile or bituminous matters, and the conversion into the nearly pure carbon or anthracite, is very curiously exemplified in the coalfield of South Wales, the anthracites of some districts giving 95 per cent. of carbon. In striking contrast with this is the cannel coal, of which several varieties are exhibited, and, among other things, some curiosity will be excited to see a wine-cooler and a temple—the Durham monument erected on Pensher Hill, Durham, in this substance. The influences of peculiar molecular arrangement will be found in a coal presenting a very curious system of grooves, which fit into each other along certain lines; and if fractured in these, a system of teeth-like arrangements present themselves. A large specimen of the peacock coal, so named from the beautiful play of colours produced by thin films of sulphur deposited in the joints, will be examined with much interest—the iridescence in this case being due to the same cause which produces the chromatic phenomena of a soap-bubble—the power of a very attenuated film to decompose light.

Bituminous Coal. Anthracite.

The Durham Monument in Cannel Coal.

Passing from coal, we naturally expect to find its associated mineral, iron; and, consequently following in this order, we now arrive at that division within which are included illustrations of the specimens of clay ironstones and hematites, and of the metal produced from these under various conditions of manufacture.

Iron Ores and Iron.

On the most easterly of the three tables here associated will be found a very extensive collection of the ores of iron produced in this country. These have

British Iron Ores.

been collected from every available district; and immediately adjoining these, on the tables against the wall, will be found good illustrations of the products of the Scotch coalfield, the Blackland ironstone, with iron manufactured from it; and also many specimens of the productions in iron of our sister island, Ireland. Many other examples of the raw material and the metallurgical results occur in this neighbourhood, amongst others a case which has a peculiar interest, as being an example of the production of steel at once from the furnace, which is accompanied by specimens of the cutlery produced.

Scotch Iron Ores.

Irish Iron Ores.

Steel produced at one process.

A model of the Ebbw Vale district, made to scale, shows the character of the country, and the order of occurrence of the beds of ironstone, &c. This model may be dissected, and thus the extent of the workings on any particular bed shown. A model of the blast furnace, employed in reducing the ore, accompanies this, and, together with the series of ores and metallurgical products, very completely illustrates the conditions of our iron manufacture, which is more particularly shown when we examine the iron exhibited by other Companies on the adjoining tables. Iron in the pig, the sheet, and the bar, and under the various conditions of brittleness or toughness, which is the result of the process of manufacture, are displayed. The fractures exhibit the molecular arrangement, upon which the quality of the iron depends; and the twisting and knotting prove relatively the toughness of the metal. The importance of iron, as illustrated in our railways, our machines, and in the stupendous structure in which these specimens are exhibited, will render this section of the first class peculiarly instructive.

The Ebbw Vale Iron-Works.

Model of district.

Furnace Ores.

Iron Manufactures.

Some models representing the underground workings

Underground Workings. of our collieries; and one showing a mode of ventilating the coal-mines, by means of a strong draught of air generated by the centrifugal force of an horizontal chambered wheel—these, with a model of a Newcastle coal mine, exhibiting all the surface arrangements very completely, well deserve close inspection.

Model of Coal Mine. A large model, on the scale of one inch to the foot, of the arrangement for "dressing" (preparing) poor ores for the market, as adopted at Tywarnhaile Mine, in the Duchy of Cornwall, is the next important object. The ores are reduced to a fine state by the crushers, and are then passed through the various channels and troughs provided, so that, in obedience to the law of gravitation, the heavier and more valuable parts may be separated. The "round-buddle," an arrangement by which the final separation of the metalliferous portion of the ore is effected, is well deserving the attention of the miner.

Tywarnhaile Mine, in the Duchy of Cornwall.

Against the wall will be found an illustration of the process of obtaining copper from the ore, as patented by Mr. Bankart. By roasting, the sulphuret of copper is converted into a sulphate; this is dissolved in water, and then precipitated by iron.

Bankart Copper process.

Three pedestals of stone and coal are placed on a raised floor, and around these the tools employed by miners in the neighbourhood of Newport. The tools of the Cornish miner will also be seen near them. The object being to show, as completely as possible, the character of British mining.

Miners' tools.

Plates of corrugated iron and other conditions, exhibit the metal called galvanized, which is coated with zinc. The process of zinc manufacture, from the ore (calamine) up to the formation of sheets and of metal castings, which, it is thought, may be made available

Zinc manufacture.

Castings.

in the fine arts, as being a cheap material susceptible of taking the most delicate forms, are deserving of attention. In the foreign department, other illustrations of zinc castings will be found, and the result promised is certainly not unpleasing, and these are susceptible of bronzing.

In connexion with mining operations, blasting of rocks is among the most dangerous processes. The safety fuses and cartridges here exhibited, are designed to obviate the chance of explosion of the powder in the bore-hole, before the men can escape to a safe distance. Safety fuse.

In a case against the wall, a series of specimens are exhibited to show the results of Longmaid's process of employing the sulphur in the iron and copper ores to produce sulphate of soda, salt cake, and to preserve the copper, silver, or other metals which may be discovered in the ore. The ore being roasted with common salt, in regulated furnaces, the sulphur combines with oxygen to form sulphuric acid, and is converted into sulphate of soda, while the chlorine of the muriatic acid attacks and combines with the metals forming soluble salts therewith. Process of separating Metals.

The model illustrative of the process of tin-smelting, from the dressed ore up to the finished product, illustrates the still simple process by which these, perhaps the earliest metallic ores smelted in Britain, are converted into metal—and arranged on the tables in the immediate vicinity will be found an illustration of Oxland's process of separating tungsten from the tin, and thus greatly increasing its value, and obtaining a product which promises to be of much importance in manufacture. Many of the tin ores of Cornwall have wolfram associated with them, and this materially injures the tin, as hitherto the processes of separating it were very rude and imperfect. The process now Model of furnace for Tin smelting. Purification of Tin. Wolfram.

Tungsten, and its Salts. employed, is to combine the tungsten in the tin-ore, by heat, with an alkali, and the result is here shown in the production of metallic tungsten, and some of

Arsenic. its combinations. Arsenic is also largely associated with the tin and copper ores: it is separated by roasting, in burning houses; the resulting sublimed matter being purified by subsequent processes, until arsenic, in the state of oxide, as here exhibited, is produced.

Tin Ore. On the table adjoining this, a series of the tin-ores of Cornwall and Devonport is shown, these are—stream-tin, the pebbles found in the debris washed down into the valleys from the neighbouring hills, and the oxide and sulphuret of tin, as found in the lode, or mineral veins.

Zinc Ores. The zinc ores of Cornwall, and those of other districts, are arranged in the immediate vicinity; these are principally the sulphuret (black-jack), and cala-

Cobalt. mine. Here also are the British cobalts, samples of

Barytes. barytes, &c.

Copper Ores. An extensive series of copper-ores will be found of great interest from the fine character of the specimens exhibited. The yellow ores are double sulphurets of copper and iron; the grey ores are nearly pure sulphurets; and the other specimens exhibit the carbonates, and less common varieties. The processes of mining in Cornwall may be regarded as having received very full illustration in the variety of the ores of in-

Mining plans dustrial value which are exhibited; sectional drawings of several of the mines—some of those being contributed from the Duchy of Cornwall: the dressing floors, and mode of dressing or preparing the ores for market, with a synoptical table, exhibiting the average of the prices obtained for copper at the "ticketings," or sales by ticket, and some other matters connected with this source of British industry. These are im-

mediately followed by a very complete set of the results of copper-smelting, as carried on at Swansea. One series of specimens shows the process by which the copper is obtained, commencing with the raw ore, as purchased from the mines, and ending with the cake of nearly chemically pure copper. The other series is of scientific interest, as exhibiting the gradual separation of sulphur from the ore, until it is at last reduced to so small a quantity that the metal begins to make its appearance. Copper smelting.

Within the same division as these, will be found most ample illustrations of lead ores, of the processes of smelting, and of the separation of the silver. Lead Ores.

Lead ores from Cornwall, Wales, Derbyshire, the Northern Counties of this kingdom, and from Scotland, are among the group. Attention will, however, be principally drawn to the series of cases containing the examples contributed from the mines in the lead district of Cumberland, Durham, and Northumberland. A section shows the geological character of the district in which the lead is mined; and by an isometrical drawing, the mode of working Nentsbury mine itself will be understood. Geological and Isometrical plan.

A very interesting case of specimens of the ores of Durham and Northumberland, which have been grouped by a working miner into something resembling the hollows, which in nature get thus filled in with crystals and metalliferous formations, deserves close examination. The cases eastward from this, contain specimens of the lead ore, in various stages of progress towards the production of the metal; the metal is also shown, and a beautiful cake of silver, of considerably more than 1,200 ounces, valued at 3,400*l.*, procured from the lead by the process of H. L. Pattinson, who also exhibits his process, and the results. In this pro- Ores of Durham and Northumberland. Silver.

cess the inventor has availed himself of the difference in the temperatures at which lead and silver crystallize, or tend towards solidity. The melted metal being allowed to cool very gradually, the crystallizing lead is removed by means of the perforated shovels exhibited, and the last portion remaining in the iron vessel is excessively rich in silver. This is submitted to oxidation in a reverberatory furnace; the lead is converted into oxide, the silver remaining behind in a state of great purity. Some beautiful models of this process, as carried on upon the property of the Duke of Buccleuch, in Scotland, accompanied by specimens of the lead ores, and a model of the arrangements adopted for condensing the fumes from the furnaces, and examples of sheet lead, and lead-pipe manufacture, satisfactorily complete the history of the metallurgy of lead. The varieties of lead ore exhibited are well deserving attention, as it is found that their external appearance, whether granular, crystalline, or laminar, indicates, to a certain extent, their richness, or otherwise, in silver.

Lead Ores.

Amongst the miscellaneous matters which find a place as illustrative of metallurgical processes, or of the application of chemical science to some peculiar branches of it, the mode of preparing platinum and palladium may be noted. The refining processes adopted at the Mint, particularly the separation of gold and silver, and the manufacture of cobalt blue, by another exhibitor, may be particularly examined. Numerous subjects of interest, which have not been named, will be found within this division, all of them imparting some useful information in connection with the reduction of the metals from their ores, with the modes of mining, or of the geological conditions under which the physical phenomena of mineral lodes, and the pecu-

Platinum.

Mint-refining

Cobalt.

liarities exhibited in our extensive coal-fields are produced.

Immediately adjoining the division appropriated to Class 1, the department of agricultural implements and machinery have their place; as these will be visited with an especial purpose, it is thought advisable to defer the notice of them to a separate section, and proceed at once in continuation of metal manufacture, into the class comprehending iron manufacture, hardware, &c.

Iron and Hardware.—Class 22.

After examining the numerous examples of cast-iron ranges, stoves, &c., occupying the eastern end of this division, we pass into the section usually indicated as the Mediæval Court, in which will be found contributed by different manufacturers, many beautiful illustrations of church decoration, and furniture in the mediæval style. Here will be found materials of a very mixed character; the glass manufacturer and the chemist unite to furnish forth the fine effects of the stained glass window. The quarries of Caen have furnished the materials for the stone carvings, and the clays of Cornwall and other parts, the tesseræ and tiles; and here is also elaborately carved oak furniture, and inlaid woods, with splendid examples of the art of the brass founder, in giving permanence to the delicate designs of the artist. Although, therefore, this division has been associated with metal manufacture, it is only really so, as far as its elaborate brass fittings are concerned, and the display of altar plate and appointments entering largely into its attractions. Rich stuffs, paper hangings, chintzes, and carpets, combine to enhance the general effect, and each will naturally receive here all that attention which arises from the effect produced by the judicious combination of material.

Mediæval Court.

Stone carving

Lamps, Chandeliers, &c., &c., in Metal.

Between this division and the main avenue, a great variety of lamps, lanterns, chandeliers, and candelabra are suspended, in many of which new and interesting forms will be found, showing the increasing desire among our manufacturers to add elegance of design to perfection of material and completeness of workmanship. Here also will be found a somewhat remarkable display of locks, and some other appendages to house furniture and decoration.

Birmingham

Passing round into the adjoining bay westward, the peculiarities of metal manufacture at once indicate that we stand in the representative section of Birmingham.

The general hardware, which is made in great variety at this metal mart, is here exhibited in much perfection, in the shape of cabinet and general brass

Brass-founding.

founding; metallic bedsteads, suspending gas lamps, with finger-plates, bell-pulls, curtain decorations, and the

Stamping.

like examples of stamping and pressing metal into forms.

Casting.

The elegant castings which may be inspected in the front bays, owe their remarkable sharpness to the fact that the metal moulds in which they are cast are kept cool during the time the melted metal is being poured in, by means of a jet of cold water projected upon them.

Galvanized Iron.

Articles of use, in the so-called galvanized iron, which is simply iron covered with zinc, by being dipped into a bath of that metal in a melted state, are numerously displayed, as are also tinned and

Or-molu.

japanned ware. Or-molu ornaments and Birmingham jewellery in its vast variety is largely exhibited, their mountings differing only from ordinary brass in containing a larger proportion of copper to the zinc employed.

Buttons.

Clasps, brooches, and buttons in metal; glass, horn,

shell, and silk display another branch of Birmingham trade; to which may be added the thousand and one small wares produced by the industry of that rising town, which for a long period has supplied the world.

The manufacture of steel pens, of which there are several exhibitors, is also well illustrated. Steel Pens.

Among the works of peace we find magnificent examples of the emblems of war, such as regulation swords, dress sabres, revolving pistols, rifles, and muskets. The beauty of workmanship upon many of these can only be seen by close inspection. Gilding, colouring, damascening, and etching on steel and iron have here been largely employed. Cutting-tools and instruments of almost every kind find also their apt illustrations. Medals and die-sinking may be examined with interest. Swords. Muskets. Gilding Steel. Damascening Cutting-tools &c. Medals. Dies.

Projecting upon the nave, papier maché manufacture, ornamented with landscape and Alhambraic painting, becomes a point great interest. Papier Maché

Passing from the division distinguished as Birmingham into the range devoted to hardware generally, we meet with numerous examples of beautiful castings in iron. A series of stoves, fenders, balcony-railings, and iron tables, are remarkable for the extreme sharpness of the castings. The perfection of the Berlin iron castings has been said to be due to the phosphorous contained in the bog iron-ore employed. At the meeting of the British Association at Birmingham, a peculiar variety of phosphorous was exhibited, of a remarkably incombustible character. It had been employed with the best effect in copper castings, and it was expected that, by combining this allotropic phosphorous with iron, the same good result would be obtained. Whether or not this has been effected with any of the examples in the Exhibition, we have not yet been able to learn. It is Iron Castin Stoves. Fenders.

Kitchen-Ranges.

quite impossible to enumerate the kitchen-ranges, steam apparatus, automaton roasting-jacks, kitchen furniture, or the more elegant grates and stoves which are here gathered together. Gas apparatus of several very ingenious kinds, are exhibited, and well deserve attention. The advantages of employing gas in many culinary operations cannot be doubted, where the principle of combining the carburetted hydrogen with a sufficient quantity of atmospheric air to ensure the combustion of the whole of its carbon, is attended to.

Gas Cooking Apparatus.

Gas chop-broilers, roasting, baking, steaming, and boiling arrangements, will be met with; many of them are novel, and all promise to be effective. Shakesperian furniture is rather a pretty idea, of which examples, embracing combinations of metal and composition ornaments, will here be found, and near these a

Gas-burners.

variety of gas-burners and lamps of different new forms of construction, the combination of glass and porcelain with brass originated with a large Birmingham firm now exhibiting. Among the many attempts which have been made to remove the objections to close stoves—particularly to the influence of heated iron on the atmosphere of an apartment—several examples will here be found. In some of these air is drawn from without the building, and being made to pass through channels of fire-brick, it flows warm into the room in

Ventilating Stoves.

which the stove is placed, the deteriorated air being removed through the chimney with which the fireplace is connected is a decided improvement.

Hot-water Apparatus.

In other warming arrangements, coils of pipe, through which hot water is made to circulate, these coils being arranged in ornamental radiating cases, are recommended for halls; of these there are also examples.

Drawing-room Grates.

Many beautiful examples of polished steel grates with or-molu decoration, and others in which metal and

pottery have been effectively combined, occupy this department. The castings exhibit in many cases a very far higher order of art than has hitherto been introduced into our metal manufactures. Some of the productions of this kind from Sheffield, Birmingham, the Metropolis, and other districts, exhibit much that is exceedingly novel and highly tasteful, showing that the result of the Exhibition has been already to unite art more closely than hitherto with manufacture The examples in which the original colour of the metal has been preserved, by the employment of some chemical agent, or in which a certain colour has been produced in the same way, are satisfactory as showing that the labours of science are appreciated in the workshops of the manufacturer. The compartment between this avenue and the nave is especially devoted to Sheffield manufacture: we have a series of models illustrating the furnaces used in the manufacture of steel through its various stages, tilt hammers, and steel in its several conditions as sent into the market. This marks the commencement of the staple of the place, and it is with increased interest and instruction that the manufactured products of carbonized iron will be studied from this point. The plain bar, ingot, and sheet of steel are before us, and knives of all kinds, from the delicate ladies' penknife to the huge carver with its three-feet blade, to illustrate Sheffield cutlery, so famed throughout the world. Saws of all kinds, from the common hand-saw to the large circular saw six feet in diameter, which, notwithstanding the delicate etching which adorns it, is still a frightful instrument, and files in an equally large, if not a still more extensive variety, are exhibited, and a model illustrating the different cuttings of these tools. Agricultural cutting implements, as scythes, reap-hooks, sheep-shears,

Sheffield Steel and Cutlery.

Knives.

Saws.

Files.

Scythes, &c.

adzes, &c., exhibited with a view to high utility, will interest the agricultural visitors, particularly those who—so conveniently are the two classes situated—pass from the agricultural department at once into this. Joiners' tools, garden tools, railway springs, royal Albert skates, sash-bars, and polished steel furniture of all kinds show the varied industry of Sheffield. The interest taken by the working men of Sheffield in this gathering together of the Industry of all Nations is seen in their contribution of files and steel highly ornamented on one side with the Industrial Palace itself, and on the other with illustrations of their own class of industry. In addition to the steel manufactory a large number of articles in other metals will be found, which from their elegance and variety, are of much interest.

Sundry Steel goods.

If we turn again from the Sheffield compartment into the hardware avenue, a new order of manufacture demands an attention which our space will not allow us to give. Baths in great variety, and decorative metal furniture of almost every description, will be found on either side. Here also we have displayed the formidable cannon with its carriage lashings complete of a man-of-war; and steel rollers of enormous size, with many very curious and ingenious machines.

Baths.

Cannon.

An examination of these brings us again to the western walls, when, turning to the north and moving eastward, we find ourselves in the department devoted to manufactures of cotton, flax, and wool.

Cotton, Woollen and Flax.

Classes 2, 12, 14.

Calico Printing.

We are properly introduced to this Class, in which the aid of the chemist is largely sought, by a "sheet of waste specimens indicating the mode of arrangement of the panorama 400 feet long, illustrative of the

calico-printing of Manchester, consisting of geometric forms, conventional arrangements of natural forms, and miscellaneous combinations and forms derived from nature." This sufficiently displays the extent of illustration which is given to this very beautiful art. The advantages of science are most strikingly shown in the operations of the calico printers, and particularly illustrated in the number of new colours which have been introduced within a few years, and the permanence and brightness which has been given to others. Manchester, London, Glasgow, and other districts have contributed to tell the story of this interesting branch of industry. The flax manufacture of Ireland has long been a marked feature of the industry of the country. We have it here illustrated by almost every variety of bleached and unbleached linen, some specimens are stated to be the finest ever produced, and these are contrasted with coarser kinds. Table-cloths, napkins, and sheeting afford but little scope for description; it will be sufficient to direct attention to their locality, and to state that some remarkable examples in the woven patterns occur. Damask table linen in the brown state, just as taken from the loom, with heraldic insertions, and a new satin tweeling applied, is stated to be the finest and strongest damask table-cloth hitherto manufactured in Ireland. Cambric and cambric muslins are in sufficient variety to show the delicacy to which the labours of the loom can be carried.

Manchester panorama.

Flax Manufacture. Ireland.

Linen.

Table Linen.

Sheeting.

Lines, twines, nets, sail-cloths, sackings, and shoe threads, from Bridport, are also in this division. Printed window-blinds from Manchester, ticks, huckabacks, duck, four-yard wide sheeting from Knaresborough, and a most extensive series of woollen cloths, worsted stuff, Leeds and Bradford blankets. All the

Bridport Twines.

Woollen Cloth.

manufactures of Leeds, Huddersfield, Halifax, and Bradford; and from Devonshire, in the varieties of broad cloth, beavers, pilots, cassimeres, doe-skins, tweeds, serges, &c., and exhibiting the art of dyeing wools in any (and almost every) colour, are to be found in Class 12. The broad-cloths of Yorkshire present an example of perfection in our woollen manufacture which cannot be excelled.

Merinos, Alpacas, &c.

Ladies will discover in this department a most extensive display of merinos, de laines, moreens, Paramatta cloths, cobourgs, alpacas, and mohairs, and all the intermediate varieties of mixed material, which peculiarly belong to their departments of dress.

Tweed. Linsey. Plaids.

Scotland exhibits her shepherds' tweed; her linsey of cotton twist and woollen weft; plaids, with the German lambs'-wool of which the finest varieties are made, particularly the Royal Stuart, Victoria, Sinclair,

Tartans.

and the 42nd; tartans in considerable variety, and also tartan hose.

Shetland knitting.

The women of the Shetland Islands have contributed the result of their industry in the specimens of shawls and veils knitted by hand in Shetland, from a thread composed of silk and wool. Stockings and other examples of the fancy knitting of these islands, particularly a group from Fair Isle, are choice specimens of this process of hand labour.

Cotton Class. North Side of Avenue.

Passing across the west end of the main avenue, we find another class of cotton goods, in the shape of striped cotton for sailors' shirts, ginghams, and the

Carlisle Ginghams.

manufacture peculiary distinguishing Carlisle. Similar productions from Glasgow, Belfast, and other places, are also in this locality.

Lace.

Laces, ancient and modern, are brought into contrast here, and tambour work, and various-worked muslins, are displayed.

If we now pass across the north-west end to the north wall, we find ourselves at once involved in a display of machinery, of which this country may be justly proud. Scarcely any portion of the Great Exhibition can by possibility prove more instructive than this.

Machinery in Motion.

Cotton Weaving.

The processes, for example, of cotton manufacture, are here most fully illustrated. The cotton, in its raw condition as obtained from the cotton plants of the New and Old Worlds, passes into the machine at one end; it presently becomes, by the magic action of this almost automatic combination of iron and brass, a fine thread; and this gliding onward through the loom, and being crossed and re-crossed by the flying shuttle, passes out at the other end of this machinery a finished piece of calico.

Book embellishing.

Cutting Boiler Plates.

New York contributes a machine for embellishing books; and (strange contrast!) near it are machines for cutting boiler-plates, bending metals, and punching holes. Steam performs, with equal ease, the most delicate labour, or such as requires the exercise of enormous force.

Spindles.

A patent machine for printing table-covers is curious, but still more so are the spindles and self-acting mules for making twist or yarn. Machinery has been employed to do strange things; and here we find a beer-barrel made by machinery, and we learn that, by the machine used, a 56-gallon beer-barrel can be made in five minutes!

Beer-barrel made by machinery.

Looms.

Warping and Weaving.

Several cotton looms are exhibited, and machines for warping, sizeing, and weaving, much of it being of a very novel character.

The history of invention is always instructive; and here we find a loom, which has been in work upwards

of 50 years, standing in contrast with the refinements of more recent machines. The illustrations of those employed for weaving fustian, silk, and canvass, show very clearly the differences of construction required. Near these are several examples of the wondrous Jacquard looms for weaving figured patterns in stuffs or silks, a process which must excite an interest amounting to wonder when seen for the first time in action.

Jacquard Looms.

Double-cylinder expansive Engine.

A double-cylinder expansive steam-engine, a machine for cutting and turning wood, and an apparatus for stopping condensing steam-engines almost instantly without any danger to the machinery, invite attention.

Circular Comb for Wool.

Near these is a circular comb for carding wool, which is stated to be the finest ever made; and several other examples of the machinery employed in the woollen factories, are spread around.

As a diversion from the machinery in motion we may turn and examine all the advantages of employing iron in the construction of a fire-proof house. A pair of wheels under a truck, to which are attached rails, intended to be put in their places as the wheels progress, is ingenious; the hoped-for advantages of this being the immense difference thus made to the draft of the carriage when passing over soft ground.

Iron house.

Iron ships.

Modes of constructing iron ships are also shown; and some new methods of securing the planking, or of covering the iron with a composition; after which the vessel could be sheathed with copper, if desired.

Without stopping to notice the engines and machines from Manchester, Yorkshire, and Ireland, all of which are very deserving of attention, the extraordinary slide lathe for sliding shaftings, 38 feet long, must be particularly named from the beauty and perfection of all its adjustments. This will be found to

Slide Lathe.

the east of the refreshment court. Drilling machines; a nut-shaping, a bolt-screwing, and a wheel-cutting machine are near it. Beyond these we have others for punching and cutting; radial drills, slotting machines, and a beautiful one for planing iron; and to work these, Ipswich contributes a steam-engine. The flat surface plates, and the experimental straight-edges, are exemplifications of the nicety to which mechanical processes can be brought, the flat surfaces being produced by scraping.

Wheel cutting machine.

Planing.

Lathes of various kinds, large and small; screw lifting-jacks, and other nice pieces of machinery, are placed in this division; but from the interest attached to it, the flax-dressing machinery must, of necessity, become a more attractive subject of consideration.

Lathes.

Much of the flax machinery exhibited involves many modifications of much novelty. We have here, machines for crushing the straw of flax, for cutting it into two lengths; peculiar holders of that new and interesting, because so generally useful substance, gutta percha. Then, here is exhibited the seed, and the flax in its various stages of progress; yarns spun and canvass manufactured; and, connected by position with these, the machinery for dressing, preparing, spinning, and twisting flax and tow. The spinning, in this instance, being by cold water, instead of steam, which is generally employed.

Flax Machinery.

Having examined all the peculiarities (and they are many) of the flax-dressing and spinning machinery, the machines which are employed for silk-weaving and for the manufacture of lace will require some attention. These several groups, which are employed in the manufacture of cotton, woollen, linen, and silk goods, must be regarded as remarkable exemplifications of that skill

Silk weaving Machinery.

which has been, since the time of Arkwright, devoted to the improvement of all our textile fabrics.

Printing-presses.

Steam printing.

Beyond these we discover a series of printing presses, of various kinds, which show the facilities afforded by steam presses, and the various mechanical contrivances which have been introduced, within the last twenty years, for facilitating all the operations of printing. By the agency of these beautiful machines, the thoughts of the great and good are made familiar to the multitude. The progress of knowledge, and the consequent improvement of the morality of a people, is ever coincident with the production of elegant literature; the diffusion of a correct system of thought, regulating all moral action. To the mechanical improvement of the printing-press we are indebted for the means of effecting this; and books in thousands can now be printed off and sold at a cheap rate, which formerly could only be produced by tens in the same time, when, of course, literature was a luxury reserved only for a few.

Paper machines.

The machines for making paper are no less ingenious than those already indicated; rags pass in at one end, and a sheet of paper presently appears at the other.

Lathes.

The power of action, of which some of the large machines, commonly employed in foundries where heavy works are executed, will be well understood upon an examination of the great lathes for turning locomotive wheels and shafts; and one which is by far the strongest-shaping machine in the Exhibition, performing circular work, as well as planing and shaping.

Models of Hydraulic Presses.

The models of very powerful hydraulic presses may be usefully studied before examining the large machines in the outer department.

The agriculturist will be pleased in inspecting a unique and useful foot machine for taking the smut off wheat, capable of cleaning 200 bushels an hour from this injurious fungus. Near this are some steam corn-mills, showing the principle of the anti-friction curve, and others for grinding grain, and also flints and bones. Machine for removing smut from wheat. Corn Mills.

A working model of a four-horse power double cylinder engine, which drives the coining press which will strike the medals to commemorate the Exhibition. Striking Medals.

The merits of Appold's centrifugal pump may be studied; it is said to be capable of throwing 2,000 gallons of water in a minute, with a fan of but one foot diameter. Centrifugal pump.

Some models from Macclesfield of improved silk-throwing, winding, cleaning, doubling, and spinning machines are very interesting. Silk machines.

Among the lace machines, one making two different sorts at a time—a very fine description of blonde lace, and a commoner kind, is curious in its arrangements. And a lever machine for twist lace has many very ingenious adjustments. Lace machine.

In the history of paper manufacture, the model of the first paper machine ever made will be examined with interest. Paper machine.

Models of hat-making machinery, and the patent-steam brewery, will give new information to numerous visitors. Hat-making machine.

Steam sugar-cane mills, sugar refiners, and other machinery for making sugar, as vacuum pans and attached apparatus, capable of turning out 80 tons of sugar in 24 hours. Clarifiers, heaters, and liquor pumps will, in a like manner, show the application of machinery to a branch of manufacture with which the public have but little familiarity. Sugar-house machinery.

Returning towards the Central Avenue, the observer cannot but be struck with the ponderous locomotive engines exhibited, in which many novel features may be noticed and much elegance of construction observed.

Hydraulic press, Britannia Bridge.

Near these is the great hydraulic press, by which the huge tubes of the Britannia bridge, weighing 2,000 tons each, were lifted 100 feet to rest securely on its towers, and unite Anglesea with the main land. The principle —that the pressure communicated to a small column of water, is multiplied over a larger mass with which it may be connected, by the difference between its surface measurement, and that of the small column, was in this example carried to the highest limits yet attained by any artificial means.

Rotary Engine.

The large rotary marine engine, near this, for propelling the screw, cannot but be regarded with interest by those who feel how much of the prosperity of England is due to the efforts of mechanical ingenuity and skill. Several other equally interesting exemplifications of the attention given to the improvement of machinery will be discovered on all sides.

Carriage department, Class 5.

Carriage Department.—Class 5.

For the moment, we would pass the court devoted to mineral manufactures, and examine the carriage department, in which a very extensive variety of vehicles, from the dress coach to the street cab and public omnibus, are collected. As these speak sufficiently for themselves, we must simply direct attention to some extraordinary examples of the wheelwright's art; and passing east, we find ourselves in the department within which the works of the tanner, the currier, and different trades working in leather, are collected.

LEATHER.—Class 16. Leather, Class 16.

Here will be found illustrations of the processes by which the skins of animals are rendered available for purposes of use and ornament. The hair being removed by the agency of an alcaline bath, the skin is subjected to the chemical action of the astringent principle of the oak bark; this principle—Tannin—combines chemically with the skin, forming a true compound of tannic-acid, with the gelatine, &c., of the animal sheet. Numerous plans for quickening the operations of the tanner have been introduced; but in all cases of chemical action, it has been found that time is an important element. Nature works slowly, and her works endure—man quickens the action, and the permanency is destroyed.

At a very early period the Hudson's Bay Company promised to exhibit their finest skins, and we have them here displayed. The case of furs exhibited is a remarkably interesting object if regarded as a natural history collection merely; but when associated with the use of these animal products for the comfort and ornament of man, it is rendered much more so. Hudson Bay Furs. Case of various Skins.

We have here exemplified the beaver-skin as imported, and with the coarse hair pulled out, and its progress towards a finished hat. Other skins and furs are shown in reference to the same class of manufacture. Beaver Hats.

The history of boots and shoes is told us in a series of imitations from the Roman and British shoes and sandals, through all the various forms this useful article has taken, to the present time. Also here are most of the skins from which the leather employed for shoes is manufactured; and in many cases are examples given of the different results of variations in the tanning and dressing processes. History of boots and shoes.

Skins for binding. Goat, seal, sheep, calf, and other skins manufactured for bookbinding, are exhibited, and the manufacture of morocco leather illustrated. Not only are the fine varieties of leather exhibited, but rhinoceros and hippopotamus, buffalo and horse skin.

Morocco.

Rhinoceros and Hippopotamus hides.

Leather Gloves. Harness. Oiled leather and Irish kid, with several varieties of buck, doe, and sheep skins, are employed to illustrate glove manufacture. Harness in great variety, and much of it highly ornamented, will be an interesting portion of this class.

Mineral Manufactures.—Class 27.

Mineral manufactures. Class 27. The mineral manufacture presents a very striking appearance: nature has furnished in the rocks of our island, a series of stones, as beautiful in colour, as varied in design, and as capable of being wrought into forms of delicacy, as any which are to be found in other parts of the world, and we have evidence in this exhibition of our native industry, in giving elegant forms to our British marbles.

Serpentines. The serpentines of the Lizard district, in Cornwall, (these rocks are combinations of silica and magnesia,) will be seen to exhibit a very interesting variety; their capability for ornamental purposes will be evident upon inspection of the obelisks, vases, font, candelabra, chimney-pieces, and other specimens; a case of serpentine, and steatite rock, with impregnations of copper, will be found interesting. The granites of Cornwall will also be seen to show some very remarkable features. This stone, so well known for its high durability, is also now proved to be susceptible of receiving elegant workmanship, and of being wrought into highly tasteful forms. In the same group porpheries, and some other Cornish productions will be found.

Granites.

Marbles. The marbles of Derbyshire, in all their variety, from

the palest encrenitical marble, to the fine black marble of that county, are exhibited. Vases of Derbyshire fluor-spar,—the now scarce variety, Blue-John, as it is locally called—of a beautiful amethystine colour; and all the other varieties of this fluoride of calcium are exhibited. The ingenuity of the Derbyshire artist in the practice of inlaying has been long known, and the finest Florentine work is here most fairly rivalled. The beauty of some of these specimens almost removing them from this into the fine arts department, cannot but attract admiration.

Fluor-Spar.

Inlaying.

Around this section will be found a great variety of other productions of the United Kingdom; some exquisite carvings in Caen stone, and numerous examples of similar works in slate, limestone, the Bath oolite, Portland stone, &c. The series of tiles, many of them being new designs, and others copies from the tiles of the Alhambra, will be admired. These productions, upon which much taste and skill was employed by the Romans, and during the Mediæval period, are ably revived. In those exhibited, some colours are introduced which were not known to the ancients; thus the moderns have a decided advantage in the colours they are enabled to give to ornamental pavement. Tesseræ in great variety and colour are also shown. These are now principally manufactured by compressing the clay in a dry state in moulds; the particles are forced within the limits of cohesive force, and are thus held together by the operation of this power; being afterwards baked, they acquire the firmness of stone, and are excessively durable. These, and other examples, promise a new style of floor decoration.

Various carved Stones

Tiles.

Tesseræ.

The numerous articles in terra-cotta, and in artificial stones of different kinds, are too numerous to notice.

They will all well repay examination; as will also several examples of ornamental constructions in connexion with house and cottage architecture. Immediately eastward of this division will be found the bays allotted to furniture, a similar space being devoted to it also on the other side of the main avenue, within which is included particularly metropolitan furniture.

Furniture.—Class 26.

Chairs. Distributed on either side, we find easy chairs for the luxuriant or weary; and some interest attaches to a copy of a chair which once belonged to the Abbot of Glastonbury. Much of the oak furniture is elaborately carved and variously ornamented; and we have modern designs and copies from the antique of considerable

Tables. merit. Much of the drawing-room furniture, contributed from the provincial towns, will be found to display great taste, and to exhibit many novelties. An

Cheffonier. open console cheffonier, for example, displays a combination of statuary marble, glass, wood—the English walnut,—and metal, which is exceedingly effective.

Cabinet. Taunton contributes a cabinet, of walnut-wood grown in the neighbourhood, elaborately carved. The supporters of the cabinet are four figures emblematic of the seasons, as shown in the contrasts of buoyant youth and the decrepitude of age. This idea is carried onward in the convolvulus, the grape, the barley, and the hop, which in carved tracery runs around the cabinet. The additional ornaments of glass, needlework on velvet, the figures from nature, will meet

Sideboard. with many admirers. Near this will be found a sideboard, in which, in addition to much very excellent

Slab of Galway Marble. carving, a slab of Galway marble, 10 feet 6 inches long, is introduced. Another sideboard, of carved New Zealand wood, should also be inspected. The

end of a drawing-room with chimney-piece of white marble, the carved figures representing Chaucer's characters, and the pillars, doors, and frieze painted in imitation of inlaid marble in the style of the Elizabethan period, and other room decorations of a very striking and tasteful character, will be found in this department.

Parqueterie.

It is obviously impossible to do justice to the numerous examples of the art of the wood carver and the cabinet-maker which occur in this class—the specimens of parqueterie or inland work for flooring—of English buhl and or-molu, as applied to elegant furniture, are very numerous. Inland tables, some of them said to be formed of upwards of 10,000 pieces of British and foreign woods are remarkable objects. An heraldic chair, involving much British history. The Aldrobandine cabinet, so called from its carving telling the incident of Aldroband presenting his first proof to Bertha. The Renaissance bedstead in walnut, and other articles in the same style, with much in imitation of the oak furniture of the Middle Ages respectively, claim attention in this department.

Buhl.

Inlaid tables.

Renaissance Bedstead.

Mirror.

A mirror, 11 feet by 7, will be regarded as a fine specimen of plate glass, and of silvering, and, together with a carved girandole looking-glass, and several specimens of this class, may be regarded as an exceedingly favourable illustration of ornamental furniture.

Bedsteads.

Bedsteads, and couches in considerable variety and most elaborately and, in some instances, most tastefully decorated, will invite attention by their attractive display, and one introducing an apparatus for making a person get up is amusing. Numerous picture frames, exhibiting great variety of carved decoration, are spread around, and examples of others in putty, composition, papier maché, &c., &c.

To the east of the furniture department, on the north side, we have the section of Fine Arts, as far as they come within the meaning of purely industrial productions.

Fine Arts.—Class 30.

Class 30. Fine Arts. Papier Maché

Within this space we have a very miscellaneous collection. The powers of papier maché manufacture are tested in mouldings of great elaboration, as in the figure of a dragon 14 feet long, and a Corinthian capital for a column. It is interesting to observe the works of humanity suffering from any deprivation of a sense; and the examples contributed by the pupils of the Blind Institution in the Avenue Road, in basket weaving and knitting, are pleasing examples.

Type.

Numerous specimens of type and of printing are to be found here, and a model of a mould for casting type on an improved principle. Stereotyping is an important, and at the same time a troublesome process, consuming much time. Gutta percha is here shown as used for receiving the impression from the type, and an electro-stereotype plate produced by the ordinary electrotype process of precipitating the metal into the mould. The machine for folding envelopes is of exceeding ingenuity, and so are the examples of compound plate printing in different colours, recommended for the prevention of the forgery of bank notes, the colours being on different plates, which, combined, form one.

Gutta Percha impression and Electro-Stereotype plate.

Compound Plate Printing.

Artists' Colours.

Oil and water colours, coloured crayons, and samples of artists' leads in great variety, are here placed. Many of the colours showing the great improvement which has been made in pigments, within a few years, by attention to chemistry. A drawing in colours also illustrates this; but a far more extensive series of

pigments will be found in the gallery among the chemical productions.

Ornamental papers and bindings are largely shown. Much of the latter being favourable examples of the advance in the art of decoration even in books. Ornamental Paper and Binding.

The work of the boys of Greenwich Hospital schools is an interesting contribution to be found here, associated with various kinds of maps from different exhibitors, some of them examples of the raised surface maps. Maps.

It is pretty generally known that paper can now be manufactured of almost any length. An illustration of this is here exhibited in a sheet 2,500 yards long, and 3 feet 10 inches broad; and another of brown paper 420 yards long, and 7 feet 9 inches broad. Paper in great lengths.

Models of many celebrated architectural structures are placed here, and also of designs for new erections. Amongst these we may mention the Martyr's Monument at Oxford; the Portico of the Pantheon at Rome; the Temple Church; Preston Hall; the Royal Arch at Dundee; of Tynemouth Castle: and there are many others. Architectural Models.

Examples of printing in oil colours, of chromo-lithographic printing, &c., show the present state of these arts. Of the latter there are some very interesting examples, displaying the result obtained after each impression taken from the individual stones: it should be stated that every colour requires to be produced on a separate lithographic tablet—a work of considerable delicacy. Printing in Oil. Chromo-lithography.

Painting on ivory of the marriage of Her Majesty, a scene at the coronation, and the baptism of the Prince of Wales, are exhibited in this compartment. Painting on Ivory.

Engraving by electricity is a new art, of which examples are shown. The process is to connect the Engraving by Electricity on Steel.

steel plate with one pole of a galvanic battery; and the engraver, a mere metal point, with the other: this is held by means of a glass or ivory handle. Every time the two are brought into contact there is a spark, a small portion of the steel undergoing combustion; therefore the engraving is a series of dots produced by the combustion of the steel effected thus by the agency of the voltaic current. This process is more applicable to steel than to any other material.

Seals engraved by machinery.

Seals engraved by machinery have two or three exhibitors.

Carvings in Ivory and Wood.

Carvings in ivory, representing celebrated characters, medallions, and studies from the antique, are nearly associated with carvings in wood of the Laocoon, the tiger hunt, &c., and sundry other pieces of similar work, some in walnut, others in box, and some in cork. A frame for a looking-glass in Gibbons' style, and a trophy about 6 feet long carved by hand in walnut, are exquisite specimens of that art to which the genius of Gibbons gave a considerable degree of celebrity. Near this is a frame of 3 feet square, composed of 2,300 pieces of tortoiseshell and mother-o'-pearl. The oak buffet from Warwick, with the stag of Kenilworth, forms a prominent object in this department.

Gibbons' style.

Trophy in carved wood.

Tortoise-shell frame.

Coins and Medals.

Specimens of coins and medals, show our present excellence in the art: amongst other illustrations, the medal presented to Major Edwardes will be found.

Satuettes from various artists are arranged in different parts.

We have the trophies of the wars of all nations, and a model of the Fountain of Commerce in gum paste, and an anatomical figure exhibiting the muscular system.

Gum paste models.

Anatomical model.

Mexican figures.

Of a like character, as works of art, are the wax

models of the Mexicans and American Indians. The Mexicans have long been celebrated for their modelling in wax. These have been executed in England by a Mexican; but they are good examples of the art pursued in that country with so much effect.

Enamels.

The process of enamelling consists in fusing metallic oxides mixed with a siliceous compound upon the surface of metallic plates, generally copper; although gold, but for its cost, would be superior to it. This peculiar art, therefore, demands much skill on the part of the artist, as he often paints in a colour which is not that which is produced after firing. The present state of enamel painting in this country is favourably exhibited. Several very interesting specimens of the art will be found in this department of the Exhibition. Immediately adjoining this section, before we arrive at the staircase, will be found the three following colonial sections, which it is recommended should be now inspected.

MALTA.

Malta.

Maltese stone.

Maltese stone has been long known to us by the very elaborate works which are executed in it, and from time to time brought to this country. The carvers of Valletta have contributed many of the most favourable specimens of their art in this material—jugs, large vases, and pedestals. We have this stone also, oiled, and prepared for pavement; and its utility as a dripstone shown.

Carvings.

Pavement.

Dripstone.

Inlaid table.

An inlaid marble table—the royal arms, and the emblems of Malta in coral and lapis-lazuli, bear evidence to the skill of the exhibitor, who also contributes figures modelled in wax, and constructed of cloth. Some of the specimens of red Gozo marble and stalactites are interesting.

Wax figures.

Red Gozo Marble.

Vegetable produce. Cotton. Silk. Wheat, &c.

The examples of the vegetable produce of Malta are very instructive: we have common Maltese cotton, and Nankeen cotton, the thread made from four varieties, and cotton fabrics also. Maltese silk and cocoons, and some beautiful examples of the silk lace of the island, are associated with these. Wheat, and cinnamon, and anniseed, and some other things are sent from the island, together with straw, and the articles made therefrom.

Silk and Nankeen manufactured. Gold and Silver filagree.

The mittens of lace, with beads, collars, cuffs, embroidered muslin, and Nankeen dresses, plain and embroidered, will be of interest to the ladies. The gold and silver filigree work of these islanders has been long celebrated. Malta has furnished to the Exhibition a great variety of specimens, illustrating this important branch of its industry: bracelets, breast pins, and chatelaines, basins, plates, flowers, bouquet-holders, broaches, and numerous other things show the character of this work: such are the interesting contributions of Malta.

Arranged near these, we have the Channel Islands: Jersey and Guernsey.

Jersey and Guernsey.

Jersey and Guernsey. Silk. Arrow-root. Models. House ventilation. Sideboard of carved Oak.

The Silk-growers Company of Guernsey send raw silk, grown by them; and we have samples of the Guernsey arrow-root, produced from the *Arum maculatun*, as illustrating the attention of the inhabitants of the island to the fresh sources of useful industry.

A model representing the visit of Her Majesty to Jersey, in 1847; and models in ornamental leather work, are not without interest; we have, associated, models of an improved system of house-ventilation; of chimney-pots; and of a lighthouse.

A sideboard of carved oak, the back representing the signing of Magna Charta, the panels worked in tapes-

try, is sent from Jersey, as is also a novel mahogany cellarette table, and a clock to go 500 days without winding up. Some specimens of tapestry-work, for ladies' dresses, mark a rather peculiar feature, and an interesting one, of the industry of these islands.

CEYLON. Ceylon.

The mineral productions of Ceylon exhibited consist of iron, tin, manganese, and plumbago. The ruby, the chryso-beryl, zircom, and tourmaline, are among its earthy and rarer minerals. Its vegetable productions are numerous, particularly coffee, cinnamon, tobacco, gamboge, tamarinds, &c., numerous oils, and wares, ivory, buffalo and deer horns are sent over, and carvings on the tortoiseshell, and in wood and stone; crockery, plain and painted; agricultural tools; gold and silver ornaments; cutlery; lace; cotton fabrics, and cordage, illustrate the industry of the Ceylonese. Models of carriages and palanquins, and of their temples, convey to us some idea of the customs of this island.

Ascending the North Stairs, and proceeding to the right, we are brought to the Ceramic series.

NORTH GALLERY, NEAR TRANSEPT.

POTTERY.—Class 25. Pottery.

To enumerate the various objects of interest within this group is obviously impossible; and to select where there is so much which is excellent is a task of difficulty, and invidious distinction might appear to be given. To avoid this the general character of the divisions of the group will alone be attempted.

Earthenware,—the common clay body,—will be seen to be materially improved in its character, and in particular its glaze is superior to what it was. Many very interesting applications of earthenware to ornamental Earthenware.

purposes are now for the first time exhibited. Much of this ware is at present manufactured with the fine qualities of the Cornish and Devonshire clays.

Porcelain.

Porcelain manufacture is of comparatively recent date in this country, the first specimens being made in the latter half of the last century by Mr. Cookworthy, of Plymouth, who drew attention to the great clay deposits of Cornwall. He afterwards removed his works to Worcester, and thus introduced this Kaolin into the north, where it is now most extensively employed. Our ordinary, or, as it is called, tender porcelain, is a clay body into which a glaze, composed of silica and an alkali, (in fact a glass), is run. Hard porcelain is a semivitrified body throughout.

Both of these will be found fully illustrated in the present collection. Some of the sets will at once strike every observer as being exceedingly beautiful, and in all respects marking a very considerable improvement in our manufacture. Many of the colours painted on our china will be found to be of greater purity than usual; and the Rose Dubarry, which was the name given to a colour employed at Sevres in the ornamentation of a set of porcelain during this favourite's reign, will be found revived for the first time in this country.

Painting on Porcelain. Rose Dubarry.

Statuary porcelain.

In statuary porcelain, or Parian—a most interesting and almost new application,—we have in addition to numerous good examples of known groups and single figures, some very fine specimens of the application of china to the multiplication of some of the purest specimens of high art.

Pleiades. Ino and Bacchus. Tripod.

The statues of the Pleiades, Ino and Bacchus, the Return of the Prodigal, and a Grecian tripod, may be regarded as remarkable examples in this line, since the difficulties which arise in the designing of the figure,

the finished one being one-third less in size than when in damp clay, and the danger of complete fusion during firing, require an unusual exactitude of attention. These figures are a true porcelain, the mass being fused throughout.

Stoneware of various kinds, and many novel adaptations of pottery, will be found in this group. Stoneware.

Against the wall may be sought examples of steam printing, for transferring to printed earthenware, and many choice examples of panels for decorative purposes, and some specimens also of painting on glass to which we have been brought by continuing our right-hand course.

North Gallery.

The contents of this gallery are of a very miscellaneous character, amongst other things the following will be found of great interest:—

Models of a proposed harbour of refuge on the eastern coast of England, of a wire bridge and a bar trellis suspension bridge, railway bridges, girder bridges, and others. Models. Bridges.

Samples of chain and chain cables; model of telegraphic lighthouse, and models of the lighthouses, lamps, and gear from the Board of Northern Lights; plan of lighthouse for the Goodwin Sands, and a model of an emigrant's galvanized iron house, and furniture adapted to it. These, plans of shop fronts, landing-piers, &c., numerous other models of new and in many cases most ingenious contrivances, will be found in this line, which space will not allow us to enumerate. Lighthouses. Shop fronts.

These are followed by a great variety of surgical instruments, adapted for almost every variety of operation, or arranged for the relief of human suffering. Surgical Instruments.

CUTLERY. Cutlery follows these, which are, as a group, remarkably fine illustrations of this branch of British industry.

Carving. Proceeding along the same line we have specimens of carving in walnut and in English oak; one piece taking for its subject the Canterbury Pilgrims of Chaucer, at the Tabard, in Southwark; another good example being the carved oak pulpit.

Moulding and carving by machinery. Moulding and panels, made by machinery, are exhibited, and ornamental sawing also by machinery.

GUTTA PERCHA. The uses of gutta percha are largely illustrated here in ornamental furniture of various kinds; and near this will be found an equally interesting illustration of

Indian-rubber. Indian-rubber manufacture.

Chandeliers of fancy straw, a bird-cage of ivory and rose-wood, shaving brushes mounted in silvered glass handles, combs, &c., all find a place in this division.

CENTRAL NORTH GALLERY.—GLASS. Class 26.

Glass manufactures. This beautiful manufacture is most fully illustrated in this group. The various materials employed in the manufacture—the sands, the alkalies, the lead, and the manganese, which when fused, form so beautifully transparent a mass, are shown, and models of the furnace, lears, pots, tools, and machinery for cutting are associated. Many very choice examples of cutting and engraving in glass will be found, and some of the chandeliers and candelabra are of very large size, and fine examples of this class of workmanship. The

Chandelier. large chandelier, intended for sixty wax lights, in style approximating to the Gothic, is a beautiful specimen of British crystal glass. Another, in the Alhambraic style, of contrasted colours of red, blue, and opaque white, is novel in all its arrangements. The style of cutting in another chandelier near this is remarkable,

Rectangular drops, lapidary cut, are so suspended as to intersect each other, and to have the appearance of an aggregated mass of crystals.

Coloured and stained glass, in great variety, is shown; and if these are compared with the colours produced in this country while the restrictive duties trammelled the manufacturer's progress, it will be discovered that our glass-makers only required a fair opportunity to rival the productions in Bohemian glass. These colours are the result of the combinations of metallic oxides, as gold, silver, copper, cobalt, uranium, &c., &c., with the ordinary flint glass. Coloured Glass.

Several candelabra are of exceeding beauty, display ing the utmost purity in the material, and the greatest skill in workmanship. A glass candlestick of the largest size is novel for its acorn drops, cut-glass oak leaves, and twisted shaft. Here are also some interesting revivals, amongst others, the old gilt diamond Venetian glass, and some exceedingly good imitations of the Venetian frosted glass. Among the numerous examples of engraved glass, a plate with profile portrait of Her Majesty, surrounded by Thorwaldsen's prize of the Triumph of Constantine, is a very fine example. Glass Candlesticks. Revival of Venetian Glass. Glass Engraving.

All the ordinary examples of flint and bottle glass are very extensively exhibited.

The examples of silvered glass will attract the admiration of many. This is really silvering, since that metal is precipitated on the glass; the ordinary processes consisting of the application of an amalgam of mercury and tin to the surface. Silvering glass.

Various substances have the property of precipitating silver from its sulution. Among others, the essential oils, aldehyde, gun cotton dissolved in an alkali, and grape sugar. This last is the preparation employed in producing the effects exhibited. The glass is made

with a space between its two walls or sides, this is filled with a neutral solution of silver, to which some grape-sugar has been added, and the beautifully pure coating of that metal is thus produced. The solution being removed, and the interior washed and dried, it is sealed from the influence of the air. By this means, under a surface of glass, is obtained the effects of metallic reflection, which cannot change unless the glass is broken.

Plate, crown, and sheet Glass.

The examples of pressed glass are numerous, and many novelties in this manufacture are introduced. Plate, crown, and sheet glass, the so-called German sheet, and patent plate, are exhibited, of very large sizes, and of superior manufacture. Some examples of glass shades are the largest ever yet manufactured, and certainly when we consider the difficulties of blowing such shades, they are remarkable examples. Some interesting specimens of optical glass are associated with these; and also very fine specimens of the alkalies employed.

Musical instruments, Class X.

In the same line of gallery, passing westward, we come to the MUSICAL INSTRUMENTS, of which a very considerable display is made—pianofortes of almost every kind, and of great beauty as pieces of cabinet work, are exhibited; harps, organs, cornopeans, horns, the newly invented euphonia serpenteclide, and various other instruments are in this group.

PHILOSOPHICAL INSTRUMENTS.—Class 10.

Philosophical instruments.

Leaving the musical instruments, passing westward, along the same gallery, we come to a most interesting

Chemical apparatus.

group. Numerous chemical and philosophical apparatus of a mixed character, are the first in order; a very useful cabinet, containing every variety of chemical apparatus being most completely fitted. Photographic

Photographic apparatus.

apparatus, and various ingenious contrivances, useful

in many kinds of manufacture, will be next met with.

Electric light

We then have the arrangement for the electric light, exhibited, showing how the charcoal poles, or points, between which the light is developed, are maintained at a uniform distance from each other, during the operation of the electric current. The attempts made, hitherto unsuccessfully, to apply electro-magnetic force as a motive power, also receives illustration. The great difficulties are, the loss of power through space, and the setting up of a counter current, acting as an opposing force the moment motion is produced.

Electro-Magnetic Engines.

Electrotypes.

Electrotypes and electrotype apparatus will be found of considerable interest, most particularly some very delicate specimens of flowers, &c., covered with copper, by the process. A film of silver is first formed on the article, whatever it may be, by dipping it in a solution of phosphorus, in sulphuret of carbon, and then into a silver solution; after which, it is connected with the battery.

Compasses.

Compasses of various kinds, with many of the most approved, and the newest arrangements for preserving these instruments as free as possible from vibration at sea, are exhibited. Near these some very fine electrical machines will be found; also a very powerful steel magnet, constructed on the principle recommended by Dr. Scoresby, and some cast-iron magnets, of much power, which can be readily made at small cost.

Electrical machines.

Electric telegraphs

Of electric telegraphs, and machinery connected with them, there are between twenty and thirty exhibitors. We have here the ordinary double-needle telegraph, and all the numerous modifications of that instrument which have been introduced. Many of the contrivances are most ingenious, and all more or less tend towards the improvement of an instrument which is

undoubtedly the most perfect illustration of a grand application of science to the useful purposes of man which has been made within our own time. The

Printing telegraphs.

printing electric telegraphs are also exhibited, and their operations will be observed with much interest.

Galvanic batteries.

All the improvements made in galvanic batteries for the purpose of ensuring constancy of action, and increased effect, are shown.

Dipping needles, &c.

Magnetic instruments, dipping, intensity, and variation needles will be found worthy a close examination, particularly the Dipping-needle deflectors, which have been employed most successfully in tracing out the lines of equal magnetic variation over every part of the globe. There are also smaller instruments of the same class for ascertaining the magnetic character of the primary rocks and other similar observations. Miner's dials, theodolites, &c., are amongst this group.

Magnetic balance.

A magnetic balance, of exceeding delicacy, is also exhibited. Here the weight of a body is determined by the force required to overcome the attractive power of magnets, instead of that of gravitation, which is the ordinary method employed.

Gutta percha application.

In the miscellaneous matters of this group will be found many arrangements connected with the applications of gutta percha as an electrical insulator, and its use in the form of tubing for communicating from one apartment of a building to another with facility, and many mechanical and electrical contrivances of exceeding ingenuity. Beyond these we arrive at the several bays devoted to sun-drawn pictures.

Photography.

Daguerreotype.

Photography, in all its principle divisions, is well represented. A very extensive series of daguerreotypes, portraits, and views of celebrated places, merit a close inspection. It is curious to notice, as they are here collected, the peculiar differences in the styles of the

portraiture in the productions of different photographic artists, arising principally from the arrangement of the lights. It is now well known that these pictures are produced by the action of the solar rays on a film of iodide of silver, and that the image is developed by mercurial vapour; the true daguerreotype picture being represented by the white mercurial film, and the dark surface of polished silver. The coloured portraits are all of them the result of painting by a process of stippling after the picture is finished. Many plans for giving permanence to these colours have been devised, the most recent being what are called enamelled daguerreotyes, a protecting glazing being applied to the surface of the picture. Several interesting exemplifications of the phenomena of solar action are shown, the chief object being to prove that light, *luminous power*, and the agent producing the photographic image, can be separated from each other.

Calotypes.

The productions on paper, calotypes, and other varieties, are numerous, and many of them exceedingly beautiful. Some copies of forest scenery are remarkable for their truthfulness, and contrary to a commonly received idea, they show that the natural landscape, with its green foliage, is capable of producing a faithful image upon any sensitive photographic preparation.

Photographs on Glass.

The most recent improvement is the introduction of the use of glass plates for the reception of the first *negative* image in the camera. The result of having so pure a substance as glass from which to obtain the positive impressions, is that pictures of exquisite sharpness are thereby obtained free from all the imperfections which attend the use of paper negatives. Many of the Photographs exhibited are from glass negatives. The truthfulness of these pictures show how valuable an adjunct to the artist is the scientific application of the fact that some salts of silver blacken in the sunshine.

Balances. Some of the assay balances in this section are fine examples of the perfection to which machines for determining the weight of bodies can be brought.

Beams and Scales. The hydrostatic balances, and ordinary beams and scales, are not without interest.

Among many other things of much interest near these will be found the dioptric and trioptrict lanterns. These are devised for throwing two or three pictures upon a screen at once by the agency of an ingenious lamp, an ordinary argand, the flame of which plays on a ball of lime, upon which, through the centre of the flame, is projected a jet of oxygen at the same time. For dissolving views and the representation of long or panoramic views, these lanterns are well suited, the images from the lateral lenses being totally reflected by carefully adjusted prisms.

Globes. A large number of globes are collected at the west end of this gallery, many of them being arranged for educational purposes, upon which the physical geography of the earth can be drawn, or the constellations of the heavens shaped as studies. Some of these are adjusted to movements showing the rotation of the earth on its axis, and amongst them portable globes, to be inflated with atmospheric air.

A charvolant, or carriage, drawn by kites, is among the many curious devices of ingenuity.

The astorama, a concave representation of the heavens, and the planisphere, are both instructive.

Vertical Orrery. A vertical orrery, and other pieces of a similar apparatus, are also here exhibited.

Gallery—West End.

Grand Organ. The grand organ, forming the central object at this end, is 38 feet high, 26 feet wide, and 23 feet deep. It contains about 5,000 pipes, the largest being 32 feet

long, and the shortest $\frac{3}{8}$ths of an inch. It has 80 stops, of which 15 are reeds, and 14 appropriated to pedal organ.

Arranged behind this instrument, and on either side, are a great variety of examples of naval architecture, from the 120-gun ship of the British navy to the fishing-boats of our shores, and pleasure and life-boats. When we enumerate model of a catamaran, of an ancient Roman galley, steering-wheel and binnacle, a case containing models of plans for fitting temporary rudders to ships at sea, of boat fitted with a rocket-gun for discharging rockets to carry ropes to a rock or a ship for the purpose of saving the lives of the ship-wrecked, harpoon gun for whales, and gun for shooting wild ducks—it will be apparent that the group is of considerable importance. The Ordnance map of England and Wales is suspended in this division.

Naval architecture.

Central South Gallery.

Passing southward by the organ, specimens of stained glass windows invite the eye, and we reach a very important scientific arrangement which would not, unless pointed out, be likely to receive the notice it merits. This is an adjustment by which the variations of the earth's magnetic intensity is made to register itself. It has been long known that the diurnal variation of the needle was regulated in some mysterious manner by solar influence. Faraday has recently proved that atmospheric oxygen is magnetic, and that its magnetism varies with temperature, thus explaining the alteration observed in the earth's magnetic force. To register these very delicate variations, photographic papers are moved by clockwork behind a screen, in which there is an opening, through which a reflected beam of artificial light, concentrated by a lens from the

Stained Glass Window.

end of a bar magnet, is thrown; every movement of the freely suspended magnet altering the angle occasions a deviation in the line impressed by the light on the sensitive paper. Thus each variation is determined with the utmost exactitude by the character of the darkened line upon the sensitive preparation. We have here photographic self-registering magnetic and meteorological apparatus, consisting of a declination, magnetometer, and bifilar, or horizontal force and vertical force magnetometers, syphon barometers, and dry and wet bulk thermometers, all rendered self-registering by this means. This method is employed in the Observatory at Greenwich, and other places, and not only is the solar beam made to register the magnetic disturbances which it sets up, but to record in a similar manner variations in the temperature and atmospheric pressure..

Barometers.

Instruments for determining the pressure of the atmospheric column are in great variety, as it regards external decoration, and of excellent manufacture, in respect to the scientific adjustments of the barometric column. There is not, however, much novelty in the construction of any of these. One very ingenious instrument for determining the variations of atmospheric pressure in the coal-mines, where the alternations of temperature are very small, promises to be of much utility. Nearly all colliery explosions occur when there is an alteration in the atmospheric pressure, it is therefore an important step to put into the hands of the miner an instrument by which every change should be easily perceived and the danger guarded against.

Thermometers.

Maximum thermometers register their greatest height usually leaving a bit of steel to mark that point: these are always troublesome owing to the liability of the steel to be involved in the mercury. A very ingenious

modification is exhibited in a maximum thermometer, in which the marker is a small portion of mercury separated from the main column by a little air : under no circumstances, unless much violence is used, can these combine ; thus a great improvement is effected.

Clocks.

A large collection of clocks of various kinds is the first principal group in this gallery. Among these is a contribution from Exeter of one of those extraordinary efforts of mechanical skill and patient industry which from time to time astonish us. Thirty-four years are said to have been spent by a self-taught artist, who died in poverty, in completing the clock now shown, the details of which are exceedingly curious, consisting of a moving panorama and figures, a perpetual almanac, adjusted to mark leap years, requiring regulation but once in 130 years, a circle exhibiting the day of the week, and marking the equation of time, together with many other ingenious mechanical contrivances, and much peculiar ornamental work. A 400-day timepiece is near this, and several very highly-wrought specimens of this art, including examples of the most delicate workmanship. Astronomical clocks, chronometers, gold watches, with various escapements, alarums, &c., will be found associated with pedometers, for measuring walking distances, and odometers, for measuring carriage distances.

Curious clock.

Astronomical clocks. Chronometers. Gold watches

It will be instructive to notice the varieties of compensation pendulums, and a model showing the system adopted in the compensation balance, by which an exact adjustment for temperature is obtained, this depending upon the different rates of expansion in two dissimilar metals. In some of the skeleton chronometers and clocks, all the varieties of motions employed in the measurement of time can be studied. Within this department is also included Count Dunin's man of

Compensation pendulums and balances.

steel, composed of 7,000 separate pieces; the whole body, by delicate machinery, being made to contract or expand in every direction.

Immediately following the philosophical instruments, as we pass eastward in the Central South Gallery, we come to a glittering display of the precious metals.

Gold and silver chasing.

Gold and silver work in great variety, and of enormous value, are shown. We have beautiful examples of castings in these metals, and also of chasing. It is stated, in illustration of the latter process, that in the figure of Death on the Pale Horse, from West, the silver is only $\frac{1}{32}$ of an inch in thickness, the legs and every part being beaten up out of the solid piece. Hammered plates appear to have been used very early, and was brought to a remarkable degree of perfection by Cellini, some of whose works are imitated in this collection.

Death on Pale Horse.

Many of the designs of centre-pieces are of the most elaborate description; and some of the vases and cups in silver and gold are exceedingly beautiful. The designs in competition for the prizes offered by the Goldsmiths' Company will be of high interest, and altogether the works of our gold and silversmiths will be found to be of a very remarkable description. Among the curious contributions to this section will be found the remarkable pebble of gold from California, purchased by the Bank of England for 780*l*. It is a mass of gold entirely unassociated with the quartz matrix in which this metal is usually found. All the California gold contains a small quantity of silver in combination; the weight of this piece is 18 pounds 13 ounces. Several fine collections of the precious stones are associated with this valuable series—tiaras, necklaces, stomachers, and bouquets of diamonds will be exhibited. Rubies in great variety, and

Goldsmiths' Company Prizes.

Gold from California.

Diamonds.

sapphires and turquoise; and a unique blue diamond, weighing 177 grains, is in this series. The jade of the Chinese will be found mounted in choice forms, as will also be the sardonyx, bloodstone, lapis lazuli, rock crystal, and almost every variety of gem in elegant gold fittings, many of the designs being new, and displaying a very high degree of taste. Blue diamond. Presious stones.

Specimens of electro-plating are very numerous. It will be understood that the electro-plate differs from the ordinary or Sheffield plate in having the silver precipitated on a surface of copper or German silver, by means of an electric current from a solution of the oxide of silver in cyanide of potassium or some such solution. The electric current is usually that developed by the galvanic battery, but some manufacturers are now employing permanent magnets as the source of electricity, the current being generated by the rotation of the armature in front of the poles. Formerly the silver was precipitated as dead or frosted metal; but by the use of a little bi-sulphuret of carbon in the solution, it is now thrown down bright. Oxide of gold, dissolved in cyanide or ferridcyanide of potassium, is the solution employed for gilding by electrical decomposition. The process is in all respects like that of silver, but a much weaker electric current precipitates the gold than the silver. Electroplating in silver. Electroplate in gold.

It will be evident that this process affords us a very easy means of producing a combination of the metals in elegant designs upon any surface. The surface being covered with an etching ground, the design is traced through it to the metal, and one kind precipitated; this is covered, and another kind deposited along other lines. Some examples of this process will be found amongst the electro-plating processes. Precipitating different metals.

Examples of Sheffield plate are numerous; this, the Sheffield plate.

old process, is still preferred for many purposes. Here the plating is effected by binding a piece of silver to a piece of copper, exposing them to such a heat that they cohere; and then rolling them out into plates, which are afterwards worked into the various forms required.

Gold drawing. Bullion fringe.

The ductility of the metals is shown by the processes of drawing gold and silver wire, and the manufacture of bullion fringe. Hanging above the central galleries will be seen a splendid display of every kind

Carpets.

of carpet manufacture: Axminster of the finest quality, velvet, and Brussels; Masulipatam carpets, and numerous others of our own manufacture; one carpet,

The Queen's carpets.

made at Axminster, for the drawing-room at Windsor Castle, is remarkable as a specimen both in design and size, being 52 feet by 38; and no less interesting is

The ladies' carpet.

the ladies' carpet, worked in Berlin wool by the Lady Mayoress and 150 ladies of Great Britain, and presented by them to Her Most Gracious Majesty. Beyond the beauty of this work, there is a higher purpose shown; it is an illustration of a branch of manufacture which can afford to its executants a recompense more liberal than they can obtain in most other sorts of needlework. These two fine productions hang at the corner where the Central North Gallery immediately meets the Transept.

Central South Gallery. Tapestry, &c.—Class 19.

The extraordinary variety of articles comprehended within this class renders it quite impossible to do more than indicate the position of the group. These articles are sufficient examples of industry in many of the channels in which it is exercised. Beautiful specimens

Limerick lace.

of Limerick lace are found in this section. Counter-

Knitted work.

panes of knitted cotton and knitted babies' dresses, one

of which is said to be composed of 1,464,859 stitches, and to have required 6,300 yards of cotton. Carpets of needlework again occur, and many of them are of very elegant design.

The knitting by the poor Irish children of Limerick, in caps, lace, &c., exhibits a kind of labour which ladies might most advantageously encourage; there is also some very remarkable Irish pearl-work executed by poor girls in the parish of Ardee, in Ireland. The Connaught schools also contribute the results of their industry, as do the Moravian establishment, Fulnech, near Leeds. The Balbriggan stockings, of remarkable softness and elasticity, Currah lace, Irish poplins, crochet brings us to the end of the South Central Gallery.

Knitting by Irish children

Pearl work

Balbriggan stockings.

South Gallery.

The South Wall is ornamented with many specimens of needlework of various kinds. A hearthrug, designed and executed by the exhibitor, representing the banners of all nations, surrounding the British crown, worked on canvass, with silk chenille and wool—is a fine example.

Worked rug.

The state bed is in all respects a fine example of design and execution. The footboard represents the Aurora of Guido, worked with wool, in tent stitch. The tester, or headpiece, is a combination of the fruits and flowers of all countries; and the centre is Thorwaldsen's Night, worked from a model. The quilt and hangings are of embroidered Irish poplin; the canopy being tastefully worked—angels holding garlands of flowers, watching over the sleepers. The draperies are all worked on canvass, with chenille, in folds, in imitation of velvet. The bedstead is gilt, in the style of Louis XIV. An extensive variety of works of this

State bed.

kind will be found in this locality; from which, passing westward, we arrive at the chemical section; but tapestry and other needlework is still continued on the walls.

Chemical Processes and Products.—Class 2.

A purely technical interest attaches to this department. The values which belong to many of the preparations will be overlooked by the great mass of the public, while they will be highly appreciated by chemists. It has been often stated that the French produced far superior pigments to ourselves; but on looking at the various examples of pigments which are here exhibited, we cannot believe our foreign friends to be very serious rivals. The crystals exhibited are, many of them, of exceeding beauty; and although it is only a question of mechanical care to produce them of any size, the purity of the salt is one which involves nice chemical knowledge.

Pigments.

Crystals.

Alum, sugar of lead, sulphate of copper, ferro-prussiate of potash, and many of those substances which give large crystals, are made the attractive objects.

Alum.

Sulphate of copper.

Food.—Class 3.

Tea contains a peculiar nitrogenous principle, theine, the same substance, is also found in coffee, and known as caffeine, but there is no chemical difference. Samples of this alkaloid are exhibited, procured from chinese tea, coffee berries, and leaves, and from Paraguay tea.

Theine.

The consumption of gelatine has increased very largely in this country; we have it here in all its states of preparation.

Gelatine.

Consolidated milk, one pound of which is said to contain the equivalent of four quarts of pure milk,

Consolidated milk.

will be found very near it. Mustard, in its various stages, is shown; and dried fruits, in great variety; honey, botanical specimens. Pharmaceutical articles, and confectionary; grains of all sorts, and seeds of all the edible plants, are exhibited. Mustard. Pharmacy. Confectionery.

The vegetable products of Scotland form a very interesting compartment. Within this, are comprehended all the products of the northern part of the kingdom, arranged in six divisions. Vegetable products of Scotland.

1. Comprises all the plants cultivated for their cereal grains, together with their straw or haulme. 2. Plants cultivated for their herbage and forage. 3. Plants cultivated chiefly for their roots. 4. Plants cultivated for their uses in the arts and manufactures. 5. Plants cultivated for their medicinal properties; and 6. Plants cultivated for their timber.

A very miscellaneous assortment, comprehending many things of considerable interest, brings us again into the section devoted to Miscellaneous collection.

Engineering.

A model of a fortified town, showing three different systems of fortification—is an interesting production. Fortification.

The exhibition of fire-arms, including rifle pistols, rifles, fowling pieces, models of field guns, and 24-lb. battery gun, and many other kinds, must be regarded for beauty of work, as exceedingly fine illustrations of the art; as are also the naval and military regulation swords. Fire Arms. Rifles. Field guns. Regulation swords.

An electro-plated steel chain mail, worn by the Scinde irregular horse, is a good example of modern armour. This brings us again to the Naval Architecture, on the South Side; and many models of fishing, pilot, and life boats, are interesting examples of the several purposes to which these are applied. By Scinde armour. Navad Architecture.

descending the stairs on the South side, we come into the department devoted to agricultural implements—to which those who are interested in the tilling of the ground may devote some attention. The examples are too numerous, even had we the ability to allow of anything like a description in this synopsis.

AGRICULTURAL IMPLEMENTS.—Class 9.

It is not practical to group the various machines and implements, since they are distributed over the whole length of the avenue by the numerous exhibitors of them, without any reference to their characters and uses.

Ploughs. Ploughs of all kinds are to be found in this collection, from the light ordinary and iron plough to the

Steam plough. horse-plough and the steam ploughing-machine. In the steam-plough the large engine is not usually used for moving up and down the field with the plough, but is stationary, whilst the plough is working from the ledge on each side up to the engine, when it is advanced the width of the part ploughed.

Dibbling machines. Dibbling machines, of many varieties, harrows of all kinds, clod-crushers, and digging-machines are numerous.

Steam-engines. Many of the steam-engines exhibited for moving agricultural implements and machinery are of very compact construction, and exceedingly ingenious as pieces of mechanism.

Thrashing-machines. Bolting and threshing-machines, for horse or hand power, winnowing-machines, barley avellers, wheat-cleaners, crushing-mills, chaff-cutters, mills, &c., may be here inspected. A model of a machine-house, with models of steam-engine and threshing, cutting, and crushing machinery, with steaming apparatus, pumps, &c., complete, as required for a farm of 400 acres, with

plans for an entire model farm-yard and buildings, while capable of giving many important suggestions to the agriculturist, is susceptible of conveying to the uninitiated the necessary arrangements for the successful cultivation of the soil.

A large number of carts of various kinds for the different purposes of agriculture, and some very ingenious new machines, capable of ploughing, sowing, or reaping, under different conditions, will prove of much interest to every farmer and country gentleman. Carts.

Beyond indicating the locality of the section it is not in our power to direct attention in detail to any one implement or machine. The collection is most extensive, and it is said, by those best fitted to form an opinion, to be highly creditable to the manufacturing ingenuity of the exhibitors.

We pass from the eastern end of the Agricultural Avenue into the room devoted to the most exalted of the arts.

Sculpture Room.

There are many exceedingly beautiful specimens of British art still retained in this apartment, although many have been removed for the purpose of decorating the transept and nave. In the centre of the room are the statuettes in competition for the Art Union prizes, many of these being very poetic realizations of intellectual imagination. The marble statue of the Hunter is a realization in stone of the fine energy of volant life. The statues of the Royal children, and some other familiar groups are in this apartment. But since the mere enumeration of the names of the statues and basso-relievos conveys no more information than the attached labels—and in this synopsis more than this could not be attempted—our path will be by the north-eastern door of this room into the Colonial Department. Art-Union prizes. The Hunters.

South Australia.

The South Australian colonies have lately attracted unusual attention from the discovery of extraordinary mineral deposits, the most remarkable being those of Burra-Burra.

Copper ores. Gold.

The copper ores exhibited will show the peculiar character of the mines of this district. The ores are most of them green and blue carbonates and red oxides, yielding from 30 to 70 per cent. of copper, the former being the variety usually called *malachite*, These minerals appear to be formed under conditions very unlike those which prevail in our mining districts. They afford evidence that at one time the whole of this mineral mass existed as metallic copper, some specimens of red oxide still holding copper unchanged in the centre of the mass; from red oxide it passed into the carbonate, the prevailing exterior crust of these formations.

A set of drawings suspended on the walls give a very faithful representation of the surface and some of the underground workings. The hills, which rise gently on either side of the valley, are clay slate; and the general character of the ground in which the ore is worked is that of an indurated clay. The quantity of copper ore of the richest quality within this mining district—still further illustrations being afforded by the contributions of the South Australian and the Worthing Mining Company—would appear to be almost inexhaustible. Smelting operations have been successfully established in the proximity of the mines, previously to which all the copper ore raised was sent to Swansea to be smelted.

Gold.

Some specimens of gold from the streams of rather an extensive district prove the existence of this precious metal.

Geological Specimens.

The geological character of the country

may be gathered from the series of lithological illustrations exhibited. Agates, jaspars, and other stones, many of them polished, and some mounted, show how far the ornamental arts are likely to be aided beyond that assistance they have already received from the introduction of the Australian malachites. Precious stones.

A case containing several bottles of olive oil is interesting as showing that the olive, although not indigenous in Australia, can be cultivated with advantage in the colony.

The vegetable produce is illustrated, in the first place, by a dried bouquet of wild flowers, somewhat injured, however, on the voyage; and then by samples of wheat, barley, and oats, and the flour from these grains; a box of soap is also shown from the colony; the mineral products, however, being the most remarkable illustrations. Vegetable produce.

Van Diemen's Land. Van Diemen's Land.

Specimens of myrtle, musk, and iron-wood, polished, and several articles of furniture—tables, sideboards, &c., show one variety of the produce of this colony, and the industrial skill of the colonists. Furniture.

A series of geological specimens enable us to form some idea of the formation of the districts from which these have been collected, and to learn their value as building stones and for other industrial purposes. That worsted work from this antipodal land should be sent to the Great Exhibition, and that we should also have specimens of pottery from so far, is in itself an interesting feature. Geology. Worsted work. Pottery.

Pickles and vegetable oils, the produce of the colony, and the oils obtained from the whale and fish; tanned kangaroo skins, and boots made from them; the skins of other animals, and specimens of leather, Pickles. Vegetable oils. Fish oils. Kangaroo skins.

Leather. Wool and corn. Vegetable products, &c.

and of leather manufacture, are grouped around, and wtih wool and corn, and the articles of domestic consumption collected in other cases—such as dried apples, starch, salts, arrow-root, and tobacco—pleasingly show the productions of the country.

Model of bridge. Stuffed birds. Turning. Cabinet work. Organ pipes.

A model of the bridge from Hobart Town to Launceston is a pleasing feature. Natural history learns something from the cases of birds, insects, whales' teeth, and a large jaw-bone. We find also some specimens of turning, and some good examples of cabinet work, and organ-pipes of wood. Such is a very hasty outline of the produce of this interesting colony.

Nassau.

Nassau contributes furs, birds, and shell-work of a very ornamental character, one example of this work in the purest white shells being exceedingly tasteful; and Demerara specimens of the produce of the island, models of the native huts, native articles of dress, and some polished woods. Also within this section will

Bahamas. Barbadoes. Bermuda.

be found contributions from the Bahamas, Barbadoes, and Bermuda, the latter contributing a model of a Bermudian boat; Corals, sea cane, and specimens of basket and straw work. Among the geological specimens we have the chalk-rock of Barbadoes; from the vegetable world we have the Barbadoes cotton, the green seed cotton the fibre of the *Yucca gloriosa*, or Spanish needles, from which the Yucca hemp is prepared, and the ropes exhibited made. Specimens

Fruits' modelled in wax.

in wax of the fruits of the Bahamas will make many acquainted with new forms of the vegetable produce —the bread-fruit, the plantain, the banana, the guava, the hog-plum, sapodilla, &c.

Fossil wood from Antigua.

A case containing the fossil woods of Antigua may be regarded as a great natural curiosity; the gradual substitution of silica for the wood is one of Nature's curious chemical processes.

Examples of the sugar-cane will also be found within this division, and many other interesting illustrations of the produce of remote colonies. NOVA SCOTIA also here exhibits her iron and her coals. Sugar cane. Nova Scotia.

CANADA. Canada.

Extending from this division towards the Nave, the space is occupied by the products of Canada. The people of this colony have well estimated the value of this Industrial Exhibition; and desiring to show the produce of their country, have, with much industry, collected their raw material, and sent with it many examples of their skill in manufacture.

The specimens of iron ore, which are very numerous, and contain examples of magnetic iron, argillaceous and bog-iron, hematite, chromate of iron from the eastern townships, and a great variety of iron ochres, prove that the produce of the country has been largely developed by the geological survey which has been carried on under the direction of Mr. Logan for the Government. Iron ore.

We have also copper ores from the Bruce Mines, Lake Huron, and copper smelted from them. Copper ores.

A case containing native gold, from the gravel on the south-east side of the prolongation of the Green Mountains into Canada, is of exceeding interest. The specimens varying in size from a mere dust to lumps weighing a quarter of a pound. Gold.

Silver ore, containing about 3½ per cent. of silver and plumbago, show the value of Canada as a mineral district. Silver ore.

Among the earthy minerals we have specimens of the magnesite rock, containing above 80 per cent. of carbonate of magnesia; lithographic stones, the qua- Earthy minerals.

lity of which is shown by the drawings upon them; agates, soap, stones, gypsum (plaster of Paris), slates and serpentines.

The remarkable pile of timber, already alluded to as standing in the Central Avenue, is a fine illustration of the value of the Canadian forests.

Agricultural produce. The contributions of the agriculturalists are large, consisting of corn in ear, Indian meal, barley, oats, peas, beans, flax, hemp, Siberian oil seed, hops, and

Maple-tree sugar. sugar made from the maple-tree.

Animal kingdom. The animal kingdom has contributed moose hide and leather, and the moose deer's head and horns; calf skin and porpoise skin considered superior to it.

Furniture. Furniture of various kinds is sent:—a bedstead of black walnut, a carved tête-a-tête table, a handsome pianoforte, and chairs and tables.

Models. Models—one of a wooden bridge, having an arch of 250 feet span; and another of a locomotive, made by a boy of 14; and other things.

Amongst the inventions from Canada are a copying-press, with a new arrangement of its leverage; and a

Copying-press. fire-engine, capable of throwing two streams of water

Fire-engine. 156 feet high, or projecting a single stream to the height of 210 feet.

Sleighs. To the English the sleigh is somewhat of a novelty; and the examples of the single and double varieties here shown will give a favourable impression of the pleasures of a winter ride in one of these elegant carriages over the smooth surface of the frozen snow. Some sets of sleigh robes complete the illustration.

Canoe. The Canadian trading canoe is a fine example of this class of boat.

Metal manufacture. Cooking and parlour stoves; a church bell, made from the copper of Lake Huron; printing types,

rifles, chopping and block adzes; specimens of cutlery and of agricultural implements, exhibit the condition of metal manufacture in Canada.

Mineral waters, the analyses of which are given. Mineral Waters.

Snow-shoes and mocassins; travelling-trunks, and biscuits; cloths, satinette, blankets, and carpets; wax and wax candles, show the variety of useful illustrations in this section. Among the novelties, specimens of what the Canadians term wild asparagus are exhibited; the object being to introduce its downy seed as an article of commerce for the manufacture of felt, for which it appears to be adapted. Cloths and Wax.

East Indies. East Indies.

Near the entrance, from the Transept, the skins of the leopard, the tiger, and other wild animals of the Indian jungles, are arranged, together with buffalo hides, and several varieties of leather. Within the last few years the East India Company have instituted a geological survey of their territory, with a particular view to the exploration of their coal deposits; and here we have specimens of the results obtained, in an interesting series of coal from the different provinces; and also examples of the iron-stone formation, and of the celebrated Wootz, or Indian steel, the peculiarity of which depends, it would appear, on its being made from magnetic iron, and smelted with charcoal. Other minerals, metallic and earthy, and examples of potters' clay are associated in this division. Coals. Wootz.

The vegetable produce in the cereals, is well exemplified; and peas, and beans, and linseed, and mustard, together with a very extensive series of dried fruits, show, thoroughly, the advantages of collecting the raw produce of a country, to tell the story of the sources of its industry. We have intoxicating drinks from, to us, Vegetable produce.

The Date. Palmyra tree. Indianhemp. Opium. new sources, such as the date, the Palmyra tree, and others. The Indian hemp, the juice of which is said to have driven mad some of the army of Xenephon, and which is still used to produce effects similar to those of chloroform, is exhibited; and opium, and tobacco, the betel leaf, the areca nut, and the Indian masticatory betel, coffee, clarified butter, and numerous other vegetable products of a similar character.

Resins, Gums, &c. Gutta percha. Resins, gum resins, and true gums are in a peculiar manner associated with India, and we have the varieties most extensively illustrated. Gutta Percha, which has been made familiar to us by the valuable purposes to which it has been applied since its introduction into this country, is here exhibited; together with articles of native manufacture in this substance.

Vegetable Tallow. The vegetable tallow, so called, which has been proved by chemical analysis to be a true wax, is likely to be brought largely into demand in this country, and will therefore be examined with some interest.

Sugars. The East Indian sugars are well known in our markets. Some curious vegetable dyes are exhibited; the black of Nepaul is said to possess some remarkable properties, and is of great permanence.

Spices, &c. Drugs. When we have named gummy products, spices, remedial agents of much value, and a great variety of ornamental woods, particularly the Lingoa wood tree of 7 feet 6 inches diameter, it will be apparent that the vegetable products of our East India territories are well represented.

Ornamental scented baskets. The ornamental baskets made of a scented wood, are of elaborate workmanship, and most interesting, as showing a class of handicraft peculiar to the East.

Deer's horns. Ivory. Deers' horns of all sizes, elephants' tusks, and stuffed birds, together with specimens of native silk, are grouped to show the products of the animal kingdom, which are usefully employed.

In addition to these the source of the East Indian isinglass is shown, and the edible birds' nests of Java. Edible birds' nests.

The metal manufactures of Mirzapore and other districts, are well represented, and their characteristic goldsmiths' work, will attract attention. The Indian carpets displayed exhibit that peculiar chromatic harmony for which the Orientals are remarkable, and the specimens of matting are very elaborately constructed. Metal manufacture. Matting.

Cashmere shawls, from the Punjaub, of great value, muslins, worked in silk and gold from the looms of Dacca, brocades, velvets and rich silks, of various kinds and colours, well illustrate the productions of the looms of India. Cashmere Shawls, Muslins, Silks, and

The tent constructed by the Thugs, the state palanquin from Travancore, the elephants' trappings, and the Lahore bed, are of considerable interest to Europeans; as will also be the specimens of the art of the lapidary, from Delhi. Tent. Elephant trappings.

The brass and copper culinary utensils are good illustrations of useful metallurgy; and we have also some very interesting examples of inlaid metals, and of bronzes. Indian cutlery of the ordinary character, and weapons of war of the most exquisite finish, show that the Orientals have lost none of their ancient excellence in the manufacture of steel. These are arranged in picturesque groups in the bay at the south-east corner of the Nave. Copper and Brass. Cutlery.

Carvings in stone and wood are curious, and many of the latter, from their extreme delicacy, no mean rivals to the works of Gibbons. The musical instruments from Bengal, are singular illustrations of nationality. Carvings in stone and wood. Musical instruments.

The model of an Hindoo temple, and numerous models of Indian vessels of all kinds, instruct us in many of the peculiarities of the East. Models of vessels.

Hindoo furniture.

Chess-tables, chairs, some of them carved in stone, and other pieces of Indian furniture, will be examined curiously from their strange beauty.

Modelling.

Several specimens of native work, in the shape of modelling, representing the mode of making a revenue settlement with the natives in the open country; natives at their various occupations; representations of public spectacles, &c., are curious; as are the numerous collection of toys and ornaments.

Toys. Ornaments.

Amongst the most valuable articles of the Exhibitions are the Lahore jewels, which are to be displayed in this department.

Lahore jewels.

The Koh-i-Noor diamond.

This hasty sketch gives necessarily an imperfect view of a most important contribution, embracing the productions of not merely India proper, but of the islands of the Indian seas, and of a great extent of Central Asia. It is, however, sufficient for the purpose aimed at in this synopsis to say, that within the bays devoted to the illustration of Oriental industry, are gathered together a series of illustration from which those who have never travelled beyond our island may learn a most instructive lesson of the Far East.

FOREIGN DIVISION.—East of Transept.

Adopting in the first place the system of indicating the striking objects in the Main Avenue, we move eastward from the Great Diamond of Runjeet Singh, Koh-i-Noor, the tale of which is so momentous—the value of which is so great, it being computed to be worth 2,000,000*l.* sterling, secured in its iron case and box, which is in itself a very ingenious piece of mechanical contrivance. Beyond this we are in the first place met by two ponderous earthenware vessels: these large jars are from Spain, and are employed in preserving wine, being buried up to their necks in the

Wine jars.

ground. Some fine specimens of artillery, a brass cannon, eight feet long, and an iron mortar and field piece, will attract attention as works of industry, resting happily in all the brightness of that peace which must be cemented by the intercourse of nations with each other. The French display several examples of statuary, the most remarkable being, perhaps, Cain and his Family after the Murder of Abel.

Some bronze castings, from France, are also very superior, as works in metal.

Parisian Organ.

The Parisian organ, which is a prominent feature in the Nave, is mounted in a handsome Gothic case, 30 feet high, and contains many improvements, among which is the pneumatic finger movement, and several newly-invented stops—of these there are 20; the longest pipe on the pedals is the *ccc*, which is 16 feet long.

Satan overthrown by an angel, is near this.

Godfrey de Bouillon.

The colossal statue of Godfrey de Bouillon, by Eugene Simonis, is a striking work of art; the same sculptor exhibits near this two pleasing statues of a crying boy, with a broken drum, and another, with a toy. Several other statues might be named, but these will be sufficiently evident in passing down the avenue.

Mazeppa.

The statues of Mazeppa and Achilles, and the beautiful window, which is admirably adjusted, are good examples of Austrian art.

Candelabra.

A very fine metal candelabrum is a good specimen of mixed metal casting.

The Egyptian vase is peculiar, from the character of the material, a native sulphate of lime, or alabaster, and not inelegant in form.

Rome contributes several very interesting marbles: Cupid and Psyche, Flora, Armida and Rinaldo, from Tasso's Jerusalem Delivered; and Venus, are examples.

Amazon.

The Amazon, by Kiss, and the other figures grouped

around, are remarkable as examples of castings in zinc. Some are retained of the natural colour of the metal, others are bronzed. That exquisite production, the Amazon attacked by a tiger, is a copy of the original statue, in bronze, ornamenting the entrance to the museum at Berlin. A little to the east still, we have the statues of Libusa and Georgius, from Munich, and the Colossal Lion, from the same city. The Lion is in every way striking, as a work of art, and is no less so as an example of metal casting. As it now stands, so it was taken from the mould; no file, or other tool having ever touched the metal since its consolidation. The perfection of every part is extraordinary.

Munich statues.

Saxony has contributed a church bell, of great beauty, weighing 650 lbs., cast in the foundry of Freidrich Gruhl, in the Moravian colony of Kleinwelhe. This casting is highly ornamented, and has inscriptions in German.

Bell from Saxony.

New Jersey, in the United States, exhibits at the Eastern end of the Nave a fine mass of Zinc ore, the red oxide, weighing 16,400 lbs.; taken from near the surface, in Sussex county; and is the width of the vein from which it is taken. There are other articles of considerable interest along the centre of this section; many of them being, however, of the same character as the articles named, they have been regarded as parts of the group. Some mosaic tables should, however, be examined, from the remarkable amount of labour bestowed on their construction.

Zinc ore.

United States.

The extreme east end of the building is occupied by the contributions from the United States of America. On the northern side of the Nave they have arranged their machinery. Among the more striking objects in

this department are a set of punching-machines of considerable power; they are furnished with rolling or knuckle joints; and since the long levers pass through a space of many feet, and these move over not more than half an inch, a large amount of power is concentrated upon the punches. A caloric engine is also exhibited, which the inventor states has many novelties; but it appears to be but a modified arrangement for heating and cooling air; the inventor is supposed to employ some gases not named; under a piston, as in his [Ericsson's] ordinary engine. A large iron safe is also sent to the Exhibition, said to be so constructed that no person but the inventor can open it. Several kinds of agricultural implements, ploughs, &c., are exhibited, and some very light and elegant carriages; with stoves and grates of various descriptions.

Punching-machines.

Caloric engine.

An iron safe.

Agricultural machines.

Stoves.

India-rubber manufacture is largely illustrated; amongst other things, by a model of an India-rubber life-boat, made to be put in a person's pocket, six feet long, and three feet wide; and India-rubber pontoons.

India-rubber.

On the southern side of the Nave is a very extensive collection of Daguerreotypes; many of them remarkably fine examples of the art. Hyalotypes, or positive pictures on glass plates, adapted for magic lantern slides; and some good specimens of the calotype are also displayed. Some of the cabinet furniture in this section is very beautful, and a grand piano, with several new adjustments, appears to possess great advantages; it is certainly of charming tone, and very high finish.

Daguerreotypes. Hyalotypes.

Piano-fortes.

The examples of the raw materials of this country appear, however, to be of a more really interesting character than any of the more finished and highly elaborate productions.

The plumbago and iron ores, both of them remarkable

Plumbago.

for their purity and consequent richness, are indications of sources of wealth yet to be developed. Looking at
Geology. the case illustrative of the economic geology of Ohio, at the very large collection of metallic and earthy minerals exhibited, and the metallurgic progress as
Pig-iron. shown in the pig iron, and finished iron, and steel manufactures, no one can avoid the thought that the district producing such minerals possesses a most valuable mine, upon which industry has only to exercise her skill.

Cotton. Samples of cotton are numerous, they have been forwarded from all parts of the States, and facts connected with them become important to us in the consideration of our own cotton manufacture.

Lard-oil. Lard-oil is an article exhibited to which some peculiarities are attached. It is remarked by the exhibitors that the oil is expressed from the lard at winter temperature. The oil thus expressed will not consolidate at any temperature above that at which it is obtained, therefore the lower the temperature at which it can be got the less the liability to consolidation. This oil has been largely employed in this country for lubricating machinery, and also for the adulteration of olive-oil.

Numerous instances of ingenuity and excellent workmanship will be found in the productions of America.

It is not without regret that we find Professor Page's electro-magnetic engine withheld, and Mr. St. John's compasses and adjustments kept back on account of the Patent laws.

Morocco leather. Flour. Indian corn. Morocco leather, Genesee flour, Indian corn and malt, prepared from it, maple sugar, mustard, smoked hams, oil of peppermint, Vermont woods, velocipedes, merino wools, and gold ores, show the wide variety of American

productions which our brethren of the United States have contributed. Their ice-producing machine, and machinery in motion already noticed, will be found worthy of the closest examination. Gold ores. Ice-machine.

In the gallery at the east end, distinguishingly marked by the American arms, there are numerous specimens of the manufactures of the United States. Gallery at East End.

A curious exhibition of fancy soaps in the shape of a coloured glass window, the colours being given to the soap. Of this article there are several exhibitors. Fancy soap.

In the South Gallery woven fabrics are exhibited. Boston sends her cottons for sheets and bed ticking. South Gallery.

New York and Massachusetts flannel, blankets, woollen shawls and cloths, and printed cotton for dresses. From New York also are some specimens of stained glass for ornamental purposes. Furs of great beauty are also exhibited. Victoria boa and gauntlets, from the skins of animals abounding in South Carolina, are very beautiful, the selection of the skins, in each, having been made out of the skins of upwards of a thousand animals. Cotton. Woollens, &c. Furs.

Russia.

Immediately west of the United States the productions of the Russian Empire find a place. These are not numerous, a large quantity not being able to reach England in time, owing to the ice. We have, however, here some very fine examples of parqueterie—a pair of very elegant gilt candelabra. Pargneteric candelabra.

In this department will be much admired a cabinet, upon which a considerable amount of art and skill has been expended. The paintings on this are very delicately executed, as are also those upon the very large porcelain vases. Cabinet.

A very fine example of metal casting will be found in

a large vase, in which some enamel work is effectively introduced.

Looking glasses, and some articles of furniture, constitute the principal examples of Russian industry at present exhibited, a large portion being yet to come.

Denmark.

In the small space occupied by Denmark will be found some examples of the vegetable and mineral produce of the country. There are many mechanical contrivances of much interest. A pump, which can be used as a fire engine, radiating stoves, and steam gauges.

Pump.

Steam gauges.

A machine for composing and assorting types, said to be capable of arranging the types with great precision.

Type-arranger.

Several musical instruments are exhibited—cabinet pianofortes and others, flutes, and an orthochard, or tuning-fork, on the prongs of which, opposite to each other, are applied weights which, being set to the degrees marked on the fork, produce different tones.

Pianofortes.

Tuning-fork.

An astronomical clock; chronometers, and some ingeniously-contrived self-registering thermometers, azimuth and other compasses, show the capabilities of the Danes in this class of manufacture. The contributions from the Royal Porcelain Manufactory at Copenhagen are very excellent specimens of the ceramic art. The paintings are of high character. Two dessert plates are deserving of admiration. The paintings are of the Tuilleries and Fontainebleau: on the edge are portraits of those French kings whose history is connected with these palaces. Since 1802 the principal business of this establishment has been that of producing copies in biscuit china of the works of Thorwaldsen. A great many fine examples of these are here. Figures from sacred and profane history. Twenty

Astronomical clock.

Porcelain.

Statuary copies after Thorwaldsen.

five bas-reliefs in biscuit of sacred, allegorical, and mythical subjects, modelled after that great artist's productions from the originals in Thorwaldsen's museum, and also a series of decorated Etruscan vases. The forms are copies of the antique, and the ornaments paintings after Thorwaldsen. The black earthenware pots used by the peasants of Jutland stand in striking contrast with these specimens of finer manufacture. Thorwaldsen. Jutland black pots.

Metal manufacture, paper, playing cards, stearine, glue, sugar-candy, and similar articles, are in the miscellaneous class of this collection.

Leather for boots and gloves is exhibited, and the articles manufactured from them. An example of *Stylography* is also exhibited, which appears to be a modification of the English process, glyphography, the drawing being made through a coating on the metal, and the copper then precipitated into it by the action of the galvanic battery. An ivory jewel casket with Thorwaldsen's Ganymede and the Eagle is a fine specimen of this class of art. Leather. Stylography. Jewel casket.

Norway and Sweden.

A statue of a shepherd boy in marble, executed at Rome, by M. Molin, a Swedish sculptor, distinguishes this space. As might have been expected, the great mass of the articles exhibited consist of illustrations of metal manufacture. The iron ores of Bofors and Dannemora, with specimens of the iron produced at these works, commence the series. Tubes, iron-plates, iron-ware of various kinds, files, and fine cutlery, sabres and swords, show the character of Swedish steel. Marble statue. Iron manufacture.

Specimens of cobalt and nickel of much interest in England, from the circumstance that our principal supply of these metals is from the mines of Norway and Sweden, are in the collection. Cotton goods made Cobalt and nickel. Cotton.

Woollen. by the hand-looms of the peasantry, and woollen cloth of various kinds, are of considerable interest. Swedish

Silk. silks and satins, moire façonnée, gros de Naples, &c., are among the woven fabrics. A portrait of King Oscar I., woven in silk, being a good example of the use of the jacquard-loom in Sweden.

The Zollverein.

The contributions in this section are of a very tasteful description, and well displayed. A very splendid gilt chandelier is amongst the most striking of the articles. The stained glass for windows contain many very fine specimens of colours. The looking-glasses are large and well-silvered, and we have arranged a large collection of curious toys. The furniture is, most of it, of a tasteful character, and displays the industry of the cabinet-maker in many striking examples.

Leather. Leather in its various conditions, and boots and shoes, form one set of illustrations, and by no means unimportant ones of the industry of the German states.

The musical instruments, especially the grand piano, are of great beauty and superior quality. On the northern side of the Nave will be found a very interesting model in cork of the Castle of Heidelberg, being modelled to the scale of 1-135th part.

A set of furniture, made of stags' horns, inlaid with ivory, is a very remarkable exhibition of this sort of work. The cabinet writing-desk is of great beauty. Two inlaid tables are also fine specimens. The manner in which the various woods are combined with mother-o'-pearl and or-molu is effective.

Woollen manufacture. The examples of woollen manufacture are very extensive, as is also that of cotton and other woven materials. In this class will be found a curious assort-

ment of crochet woollen-work, particularly worsted gloves, silk purses. Spun coat and waistcoat buttons form an interesting section.

Carving in ivory.

The carvings in ivory from Darmstadt are exceedingly beautiful; the principal article of the group being a colossal goblet. The battle fought by Herman, from a picture in the possession of the Grand Duke of Baden, is engraved on it in alto-relievo; it is supported by figures of eight German emperors; the cover is in the form of a cupola surmounted by the figure of Germania; the minor ornaments are in the old German style.

Stained glass.

Patterns of stained glass are very effective; as is also the ordinary flint and coloured glass, and the examples of pottery.

Pottery. Hamburg.

Hamburgh contributes largely in the way of metal manufactures, and coloured and printed woollen and cotton cloth.

Prussia.

The contributions from Prussia are highly important; but we can do little more than indicate their main characters.

Dyed woollens.

Woollen manufactures are most extensively displayed, many of them being fine examples of dyeing, —the colours of great brilliancy; velvets and silks, raw and bleached linens, shawls of various kinds, embroidered lama stuff, and many similar articles are exhibited to show the industry of Prussia as represented by woven materials.

Berlin patterns and wools.

Berlin has long been celebrated for its paper patterns for the Berlin wool-work. They are here exhibited in great variety, and the ladies may feast their eyes on the brilliant display of colours which are here associated.

Iron castings.

The iron castings of this city are no less celebrated, and of these the Exhibition has many fine examples.

The illustrations commencing with iron ore, the carbonate and hydrated oxides are continued to the production of specular steel iron, to cutlery of every variety, and the reproduction in metal of works of the highest order of Art.

Metal manufacture.

The other metalliferous ores of Prussia, and many of the earthy minerals are exhibited with the manufacturers of lead and zinc.

Lead and zinc.

The chemical collection is an exceedingly fine one, and cannot be examined without interest.

Chemicals.

A considerable variety of scientific apparatus, much of it possessing features of novelty, are also interesting.

Scientific apparatus.

The bronzes are of great beauty. Victory standing on a rock and throwing a wreath to the victor, by Ranet, and Victory writing in the Book of History the names of those victors she has crowned, may be taken as fine examples of mixed metal casting.

Bronzes.

Papier-maché is largely employed in Prussia, and examples of its varied applications are now contributed.

Papier-maché

The porcelain manufactories within the kingdom have been long most celebrated, and every variety of the Ceramic Art which has received any attention forms a portion of the beautiful illustrations contributed to the Exhibition.

Porcelain.

The States of the Zollverein are, altogether, very large exhibitors.

Nassau sends calamine and other zinc ores, iron ores and manufactured iron, coal, and lignite and amber.

Metals.

The chemical manufacturies of the Zoolverein send examples of their products, and these are numerous and choice specimens. Amongst the pigments, the smalts, ultramarine and cinnabar are very striking specimens. Perfumery, sugar, samples of dried fruits, macaroni, tobacco and cigars are but a small portion of a very extensive miscellaneous series.

Chemicals.

Pigments.

Ships' beer, which will keep for many years in any temperature, soap, starch, flour and seeds are sent in illustration of the products of nature, and the industry of the people. Beer. Starch. Flour.

Wool fleece of a remarkably fine character, cotton, silk, and woollen cloth, glazed printed calico, lace, and table covers, are the production of the looms of these States. Wool fleece

Book and book-binding machinery, leather manufactured into ladies' baskets, writing-cases, braces, and numerous other articles. Musical instruments, ivory toys, chessmen, card and fancy note-paper, together with some beautifully arranged examples of metal button manufactures, show the extensiue contributions of the Zollverein. Leather.

A large terrestrial globe, showing the comparative elevations of the land, mountains, &c., above the level of the sea, is instructive. Globe.

A gilt chandelier, and numerous lamps and candlesticks, form an interesting group.

Terra-cotta, earthenware, and true porcelain in considerable variety, will all be found in the southern compartments. Terra-cotta. Porcelain.

On the north side, papier-maché articles, jewellery in gold and silver-gilt frames, porcelain, and glass ornaments, toys, stuffed birds and other animals, together with a very extensive collection of every kind of steel manufacture, will be found. Jewellery.

Austria.

The Austrian exhibition is of a very remarkable character. The porcelain and glass articles near the Nave are very striking examples of these classes of manufacture. Paintings on wood, paper, and canvas, for ornamental purposes, are extensively exhibited. Porcelain. Glass. Painted papers.

The large hall, the floor being a very choice example of parqueterie, and the roof of painted canvas, and the

Suite of rooms. suite of rooms representing the interior of a palatial residence; consisting of sitting-room, dining-room, library, and bed-room, will be visited with eagerness, and surveyed with admiration. The furniture and ornaments are alike tasteful and elegant.

Book-case. A book-case of carved oak, intended as a present to Her Majesty, is a very beautiful specimen of carving.

The furniture exhibited, of which there is a large variety beyond that already named, is exceedingly beautiful.

Steam-engines, model of bridge, specimens of printing from the Government printing-offices, oil paintings

Oil printing. and printing in oil, so closely resembling each other as to be with difficulty distinguished. On the southern side of the Nave, fresh examples of porcelain and glass are again seen; the green and white vases being remarkable for size, elegance, and colour; and the illus-

Painting on porcelain. trations of painting on porcelain within this bay are exquisite examples of art which has long received the marked patronage of the Austrian government.

Sculpture-room. The sculpture-room contains many beautiful works of art in marble and in plaster. The Ishmael is a choice example. Here are also some specimens of remarkable size of paintings on porcelain, and the high finish of these works must recommend them to every attention as choice productions of art.

Among the miscellanies of this large section may be

Cottons. named the following specimens of coloured cottons,

Woollens. woollens, and blankets. Pipes and pipe-stems in infinite

Gloves. variety. Gloves. Musical clocks. Walking-sticks,

Toys. Riding-whips. Stands of toys. Ladies' parasols, exhibiting the high style of the belles of Vienna. Fancy

Mineral. boots and slippers. Candles and minerals.

A large iron crucifix, 15 feet high, swords, daggers, rifles, pistols, cutlery in great variety, and numerous metal wares, files, scythes, and all sorts of tools, show the character of Austrian metallurgy and metal manufacture. Iron casting. Steel cutlery.

Belgium.

Entering on the northern side, very ornamental paper-hangings are exhibited. Musical instruments in great variety, and furniture still more various, may be examined with interest. Paper hanging. Furniture.

The patent humectator, a machine used for moistening corn, steam-engines, and locomotives, well illustrate Belgium machinery. Machinery.

On the south side Brussels carpets are exhibited. Ornamental carving in oak, and a splendid gilt chandelier. Cotton and woollen fabrics in considerable variety. About twenty carriages, of different descriptions, are within this section. Leather of many kinds, and India-rubber clothing, will be found near those. Carving in oak.

A stand-of-arms look formidable, and the guns and swords around make a good display. Specimens of beautiful furs are also worth examination.

An altar-piece of Leclerc, and the statue of a Canadian woman weeping for the loss of her child, are fine specimens of art.

The woven articles, particularly the broad cloths, will be found to be fine examples of the productions of the Belgian looms.

France.

The important exhibition by France of her industry cannot possibly be described in the very hasty glance we are compelled to take of it. It is in everyway creditable to that great nation, and will be viewed by all with admiration.

Tapestry carpets.

¶ An apartment against the north wall is devoted to the tapestry and carpet work, for which France is so far famed. The large work on the west wall of this room is a very interesting contribution. Commerce and industrial art are united, the four quarters of the globe are indicated as contributing their stores. By a well-turned compliment, Manchester and Birmingham are honoured, and the symbols of the more important divisions of human labour are introduced. The smaller examples of this class are very elaborate, and many of them beautiful.

Music.

Musical instruments are exhibited in considerable variety. Iron castings, intended for fountains, a fine bronze, eagles and deer, will be found in this locality.

Spinning machinery. Printing presses.

The spinning machinery, printing presses, and numerous examples of the application or steam power, and of mechanical skill, will be curiously examined.

Metallic cements, zinc works in great variety, and comparative illustrations of zinc and lead paints, are associated. A large variety of or-molu clocks, and clocks with steel ornaments, will attract attention.

On the south side of the Nave the delicate work in hair, silvered glass, bijouterie in all its forms, constitute a very interesting feature.

A very large series of designs for carpets, shawls, paper and lace, will be found near the south wall, together with specimens of printing, binding, &c.

The silks of Lyons, woollen and cotton goods, lace, and numerous other examples of the productions of the looms of France are of great import. The larger collection of these will be found in the Central South Gallery.

HOLLAND.

Some very fine candelabra will be noted as extraordinary works; and within the section devoted to the

Dutch contributions we find nearly every variety of manufacture belonging to this industrious people :— metallurgy, metal manufacture, woven fabrics, basket-work, clocks and toys, with numerous articles of the highest merit form the interesting features of this section. A small percussion cap-making machine, producing them from the ribbon-copper, and a sugar-crushing machine, are good examples of machinery.

Italy.

The collection of minerals from Italy will be examined with much interest. They have been collected with much industry, and display very fully the resources of the country. Example of chemical products, sulphuric and nitric acid, are associated with the sulphur ores, and iron and steel are shown in connexion with the iron ores.

The specimens of silk in all its stages are numerous ; and the vegetable products of the country are fairly exemplified. Woven and dyed silks, velvets, and other productions from the looms of Italy are collected.

A considerable portion of furniture, exhibiting the peculiar character of Italian cabinet-work, is shown. The inlaid tables are, many of them, very beautiful. A cornice, in pear-wood, carved and ornamented with fruit and flowers, ; a curricle chair, and inlaid pedestal ; an Etruscan cabinet floor ; and some of the furniture in white wood and mahogany, will attract much attention. The combinations of silk ornaments and marqueterie are very pleasing.

The works in silver filagree, the silver plate, chased and engraved, the examples of artificial marble, the illustrations of the medallic art, and wood carvings, render the Italian section of the Exhibition very inte-

resting. A very beautiful table of mosaic work illustrates this extraordinay art.

Spain and Portugal.

Hats, caps, lace, and ribbons first meet our view.

Cotton working, fancy flower work, and altar decorations are spread around the section. Good slabs of marble are exhibited, and a very fair series of the minerals of these countries, which have lately been attracting the attention of English capitalists. These are too extensive for enumeration.

An ivory carving of Prometheus chained, is a fine work in ivory.

The principal vegetable products of Spain are collected, and some of its manufactures. Lace of a very handsome description will be found on the walls.

The most remarkable contribution from Spain appears to be the custodia, a piece of altar furniture, made in Spain for the cathedral of Lima, of gold and precious stones, valued at 28,000*l.*

The swords of Toledo are exhibited, and many other superior arms.

Cigars from the Havannah are a prominent feature; and specimens of silk in its raw state shows the result of the cultivation of silk in Spain.

An original piece of the Moorish palace of the Alhambra, about 2 feet square, is an interesting object.

Switzerland.

Woven goods

The woven materials of the Swiss cantons are very interesting. Cotton prints from Neuchatel. Helvetian grey warp and weft woollen yarn; lace and blonde, much of it of very elaborate design and beautiful workmanship, fully illustrates this branch of industry.

Clocks and watches.

Clock, watches, musical boxes in large variety, show

the skill displayed in this class of mechanical skill, for which the Swiss have been long celebrated. A number of very delicate adjustments are introduced, some of them of a very novel character.

The works in straw, particularly the large round baskets ornamented with blue satin, will please, as another branch of industry, which largely employs the industrious peasant population. Straw work.

Iron ore and metal; iron wire; some steel tools, and a few fire-arms are also shown as the production of the country. Iron. Steel.

We have now arrived near the transept, on the north side of the east nave: EGYPT, GREECE, TURKEY, PERSIA and ARABIA display their stores.

Drugs, seeds, and grains are shown; many of the mineral products, manufactured silks, calico, saddles for dromedaries and horses, head-dresses in gold and velvet, pipes, coffee-sets, dried fruit, &c.

On the southern side some of the products of BRAZIL, CHILI, PERU, and CALIFORNIA.

The silver ores of Chili, and the gold ores of California are exceedingly interesting specimens.

Within these bays, and around the east side of the transept,

CHINA

is represented, and amongst the beautiful examples of Chinese skill, the model of a Joss house will be much admired.

TUNIS.

The collection within this bay consists chiefly of articles of clothing, much of it very highly ornamented, skins of animals, matting, carpets, &c.

The model of a Tunisian tent is a very interesting object.

The Galleries

south and east of the transept present a still numerous and miscellaneous series.

The glass windows on the northern side; the illustrations of carpet manufacture by the foreign nations; and around the transept the numerous examples of British industry, in the shape of articles of clothing, have an interest of a peculiar characrer, and will well repay examination.

The Electric Clock

marks the centre of the transept, and the end of our very imperfect labour.

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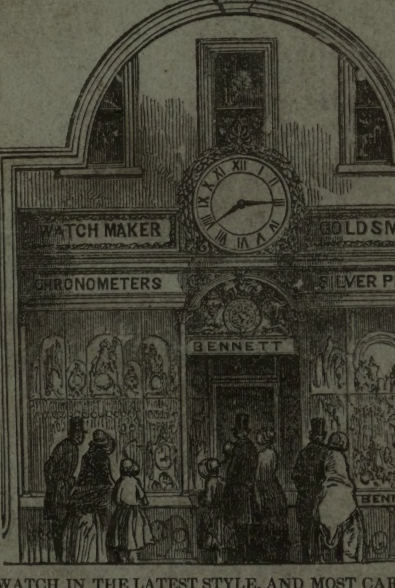

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